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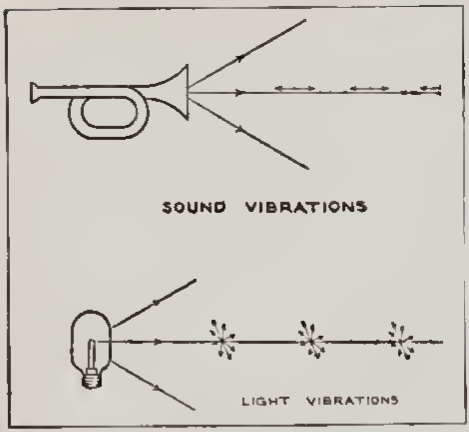

Fig. 1 Sound waves vibrate along the direction of travel light waves vibrate at right angles to the ray, and ordinarily in all possible directions

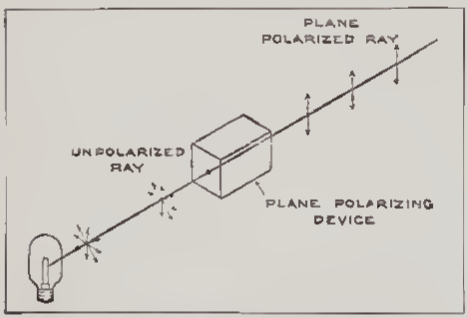

Fig 2 Any plane polarizing device cuts down the possible directions of vibration to only one: this one is parallel to the vibration plane of the device

OUR eyes respond naturally to differences in color and in intensity of light, and it is by these differences that we are able to see the world around us There is another property in which light rays may differ, but our eyes, unaided, can not see those differences This property is called "polarization," and is concerned, as explained later, with the manner in which the light ray vibrates Light rays may be polarized by optical devices, they are also partly polarized by reflection from common objects It also happens that clear skylight is partly polarized For the last two reasons, much of the light by which we see things is polarized to some extent, a fact we first realize when we look through an Eastman **Polo-screen**

The Nature of Light Rays

The nature of light has long been a matter of speculation It was once generally held that perception of light depended upon the reception by the eye of small discrete particles shot off from the source of light, just as at one time it was held that the perception of sound depended upon the impact upon the ear-drum of small particles shot off from the sources of the sound This theory of light has the advantage that it immediately explains reflections, just as an india-rubber ball bounces from a smooth wall, whereas it will be shot in almost any direction by a heap of stones So these small particles would rebound in a definite direction from a polished surface, such as a mirror, whereas a rough surface, such as paper, would merely scatter them This theory of the nature of light appeared adequate until it was found that it was possible, by dividing a beam of light and slightly lengthening the path of one of the halves, and then re-uniting them, to produce periods of darkness similar in nature to the nodes produced in an organ-pipe, where the interference of waves of sound is taking place. It could not be imagined that a reinforcement of one stream of particles by another stream of particles in the same direction could produce an absence of particles, while the analogy with sound suggested that, just as sound was known to consist of waves in the air, so light also consisted of waves

Light can not consist of waves in the air, partly because we know that it travels through interstellar space, where we imagine that there is no air, but also because the velocity of light, 186,000 miles per second, is so great that it is impossible that it could consist of a wave in any material substance with which we are acquainted It is, however, supposed that there must exist, spread through all space and all matter, what is termed the ether, and that light consists of waves in this ether

How Light Waves Are Polarized

The vibration of a light wave is not along the direction of the ray, as in the case of sound, but is at right angles to the ray and usually in all possible directions, that is, up and down, sidewise, etc It is possible by various devices to change the light ray so that it vibrates in only one direction, as shown in Fig 2 This one vibration is not only composed of the one originally vibrating in this same direction, but is also composed of parts of all the others, except the one vibrating at right angles to it The result is that almost half of the light is allowed through, even though there is only one direction of vibration It may help to explain this if we draw an analogy

Imagine a string stretched horizontally, passing through a slit in a card at right angles to it If the slit is vertical, the string is able to vibrate in a vertical plane only, and if the slit is horizontal, the vibrations are restricted to a horizontal plane If the card is rotated, the vibration plane of the string follows the slit Light behaves in much the same way, except that the vibrations require the optical equivalent of a mechanical slit A light ray in which only one direction of vibration exists is said to be **plane polarized,** that is to say, polarized in one plane The plane of polarization, that is, the plane parallel to the vibration of the emerging ray, is definitely fixed in the polarizing device, and is rotated when the polarizing device is rotated A second polarizing device, placed in the path of the ray leaving the first polarizer, may or may not transmit the plane pol-

Possibilities of Polarized Light*

by

F. Tuttle and J. W. McFarlane**

* Reprinted from July 1935 Journal of the Society of Motion Picture Engineers as presented at the Spring 1935 Meeting at Hollywood Calif

** Eastman Kodak Co., Rochester, N. Y.

arized ray, depending upon its angular position. At one angle, practically no light is allowed through, and the polarizers are said to be "crossed." At 90 degrees from this position, all the light from the first polarizer goes through, and the polarizers are said to be "parallel."

A number of polarizing devices, such as prisms made from crystalline Iceland spar, known as Nicol prisms, have been known to scientific workers for many years. Up till now, there has been no polarizing device suitable for ordinary photography. Nicol prisms are very costly, have a very small field, their length being much greater than their free aperture. The desirability of a highly efficient polarizing device in sheet form has been recognized for some time. Such a material is now available, having the necessary optical properties and capable of being produced upon a commercial basis in sufficiently large sheets at a cost low enough to make it practical in photography. The invention is due to Mr. Edwin H. Land, who was the first to prepare a commercially practical sheet containing a polarizing material oriented properly for satisfactory performance. In this material are countless minute rod-like crystals, which are all parallel to each other. They may be regarded as optical slits, so when the material is rotated, the direction of light vibration is rotated, just as rotating the slit made the string's direction of vibration follow it. The Eastman **Polo-screen** incorporates this polarizing sheet material, cemented between glass plates. The Eastman Polo-screen is therefore a large polarizing device, free from the limitations of the Nicol prism.

The Importance of Polarized Light in Photography

The importance of polarized light in photography is due to the way in which all natural substances reflect polarized light. When a ray of light falls upon, for instance, a sheet of paper, the light that is reflected is composed of two parts which are technically known as the specular and diffuse components. The specular component forms what we know as gloss or glare and enables us to see more or less distinctly an image of the source of light. Light reflected from polished metallic articles is almost entirely specular whereas that reflected from chalk is almost entirely diffuse. The diffuse component is reflected without glare in all directions.

Now, if the ray of light that is illuminating our subject is plane polarized, the reflected rays that form the specular component are still plane polarized, but the rays reflected diffusely are not. If we look at the subject through a Polo-screen, we can orient the screen so that practically all the specular reflection is stopped, and see the subject by diffusely reflected light. This fact, which is extremely important, permits the many applications described below. The use of Polo-screens in front of the lights illuminates

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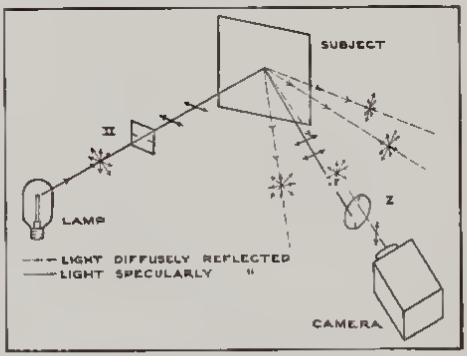


Fig. 3. Photography by diffusely reflected light, using polarizing equipment. Light reflected specularly retains its polarized form. It may therefore be cut out by a Polo-screen at the camera. I indicates a Polo-screen Type I, II indicates a large Polo-screen, Type II. The indexes on the two Polo-screens show their plane of vibration.

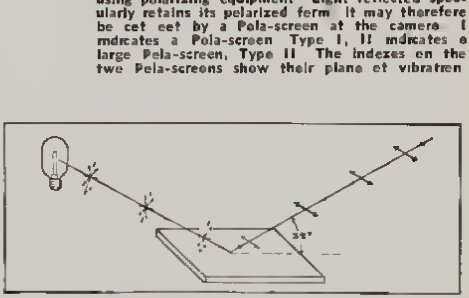


Fig. 4. Ray plane polarized by reflection. A ray of ordinary unpolarized light is almost completely polarized when specularly reflected at about 32 degrees to any non-metallic surface such as glass. This permits eliminating oblique reflections from glass and water by a single Polo-screen over the lens.

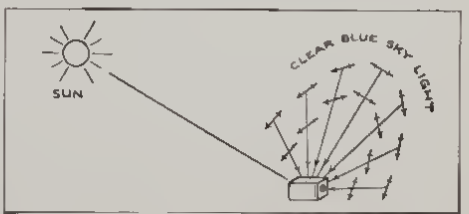


Fig. 5. Clear blue skylight arriving at right angles to the sun's rays, is polarized. The sky may be darkened by the Polo-screen without effecting the color rendering of foreground objects. The strongest effect is obtained with the camera axis roughly at right angles to the sun's rays.

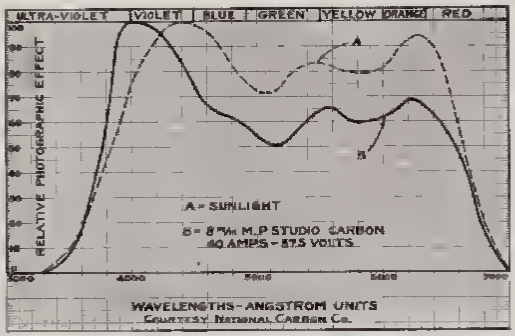


Fig 1

Artificial

LIGHTING equipment for any system of natural-color cinematography must conform to definite specifications as to intensity, beam-distribution, and spectral energy distribution or color In this latter requirement is the answer to the question, so frequently asked, why carbon arc lights are so universally used for color cinematography

Actually, almost any illuminant used in monochrome cinematography can be used for color-filming but experience has proven the white flame carbon arc to be the most efficient light-source for this work Almost all color processes take the spectral distribution of natural sunlight as the normal lighting, and balance their emulsions, compensating filters, and laboratory processes upon that basis Obviously, if the light used to illuminate interior scenes differs in color from this standard, a corresponding degree of modification must be made in either the photographing or the processing of the color-film, if a normal color-rendition is to be had. In general, corrective filters must be applied either to the light-sources themselves or to the camera—a practice which, in effect, results in wasting a considerable part of the light produced It is much more desirable to employ light-sources which radiate light closely comparable to natural sunlight

The white-flame carbon arc does this excellently, as will be seen from Fig 1 Meeting the requirements for intensity and beam distribution is then a matter of designing the proper lamps around this desirable light-source

When Technicolor prepared to introduce its three-color process, one of the most important steps was providing for adequate lighting equipment A survey of existing carbon arc lighting units showed that the majority of these units had been in service for ten or more years, and were scarcely adequate to the requirements of modern production This was especially true of those units used for the general lighting of sets They did not deliver a sufficient quantity of light for economical use with color cameras, nor did they distribute it with the desired efficiency In addition the carbon feeding mechanisms of some of these units allowed a considerable variation in trim during the burning period, resulting in noticeable changes in both the color and the intensity of the light emitted In some instances, this mechanism also produced mechanical noises (aside from the electro-physical noises which can be eliminated by the customary choke-coils and condensers) which could not be tolerated in sound recording

The fundamental unit used for general lighting is the "side arc" or broadside Technicolor's specifications for these units called for a lamp capable of producing an illumination level of 200 foot-candles at a distance of 15 feet, evenly distributed over an angle of 60 Its light should be constant in quality and quantity during the period of operation, it should burn silently, and the light radiated should be of spectral quality closely comparable to sunlight.

Existing lamps completely failed to meet all but the least of these specifications Tests showed that such units produced an illumination-level of only 60 foot-candles at 15 feet—slightly over 25% of what was required The distribution was far from even The feeding mechanism, in which a single solenoid system controlled both of the lamp's two arcs, allowed variations of from 20% to 40% in light flux during the burning period, and introduced mechanical and electrical noises which were highly undesirable The carbon feed was intermittent, rather than continuous in its action The best that could be said of the lamp was that its light was of the ideal spectral distribution for color cinematography

The best way of correcting these shortcomings was to design an entirely new lamp Collaboration with the engineers of the National Carbon Company produced a new type of carbon which gave an even more ideal spectral distribution. The new carbon is 8mm in diameter, as compared to the ½-inch carbons previously used Burned at the same amperage as the older type (40-45 Amperes), it gives a snow-white light of considerably greater intensity

Around this light-source, the new lamp, known as the MR Type 29, was designed A separate mechanism was provided to feed each of the arcs, thereby insuring greater uniformity in the light-flux, and mechanically silent operation The reflecting system, by virtue of modern design, gave an exceptionally even distribution of light over the required 60° angle The intensity produced—more than 220 foot-candles at 15 feet—exceeds the requirement by 10%, and the light produced is constant in both quantity and quality In operation, the lamp is silent, and the spectral energy distribution is almost identical with that of sunlight.

A companion to this broadside is the "scoop," MR Type 27 (Fig 2), used for overhead lighting It is identical with the broadside except for the means used for its physical support and the shape of its hood

For spotlight purposes, the familiar 80 Ampere Rotary Arc spotlight is the most generally used unit Though it is not, judged by the most modern standards, an ideal unit it proved adequate for use with color cameras In most instances, the basic change necessary—fitting fibre gears to silence the feed mechanism—had already been made Careful attention to maintenance is, however, necessary pitted and soiled condensers will materially reduce

Sunlight for Color Cinematography

by
Peter Mole
Mole-Richardson Inc

the light output, and variations in the arc gap will alter the spectral characteristics of the light sufficiently to be visible in the Technicolor picture More modern units are therefore being developed to replace these lamps.

Due to the inherent characteristics of the high-intensity arc, the spectral energy distribution is found to be considerably higher in the blue than is that of the broadside For this reason, a straw-colored gelatin filter is used over these lamps in order to maintain the proper color balance

Where the highest intensities are required, the 24" and 36" sun arcs are used Existing units of this type are, in the main, satisfactory for color photography when properly silenced by choke coils and fibre gears, and when fitted with straw-colored gelatins to equalize their spectral distribution

There is no danger from "klieg eye" with modern arcs, properly used "Klieg eye" is caused by various of the ultra-violet frequencies lying below 3400 A., which can easily be filtered out by placing a sheet of ordinary lead glass in front of each arc This is invariably done on Technicolor sets, and since the visible spectrum lies entirely above 3400 A , the injurious frequencies are eliminated without any loss of useful light At the other end of the spectrum—beyond about 7,000 A —lie the infrared and heat frequencies, which can also prove objectionable when a high intensity of illumination is used In comparison to the current consumed and the light produced, carbon arcs emit less of these high frequencies than any commonly used illuminant

All of these lamps may be fitted with special filters and diffusers in order to produce effects necessary for any scene. Gelatin hangers of various colors, for instance, are used for projected color effects, or for isolated effect lightings Frosted gelatin hangers are used to soften down some lamps The sun arcs can be fitted with cylindrically lenticulated "diverging doors" when it is necessary to diffuse their light The broadsides may be fitted with special Factorlite glass screens, sandblasted on one side and moulded on the other, for diffusing purposes

In conclusion, it should be stated that while these new units have been developed, and the older ones modernized, for use with the three-color Technicolor process, they are essentially adaptable to any conceivable color process Sunlight will always be the normal light-standard for color photography, for commercial practicability will demand equipment which can be used interchangeably, indoors and out And for illuminating interior scenes for color, the modern carbon arc lamp is thus far the closest approach to artificial sunlight.

A brief summary of the lighting units most generally used in Technicolor photography, together with notations as to the lamp-type, trim, current and uses, may at this point be of interest for reference purposes

A General Lighting Units

1 Twin-arc broadside (MR29) Twin vertical trim, double solenoid feed Trim 8mm x 12" copper-coated studio carbons, positive and negative Current 40 Amperes, 35-40 Volts at arc Use general floor lighting

2 Twin-arc Scoop (MR27) Twin vertical trim, double solenoid feed Trim 8mm x 12" copper-coated studio carbons, positive and negative Current 40 Amperes, 35-40 Volts at arc Use general overhead lighting

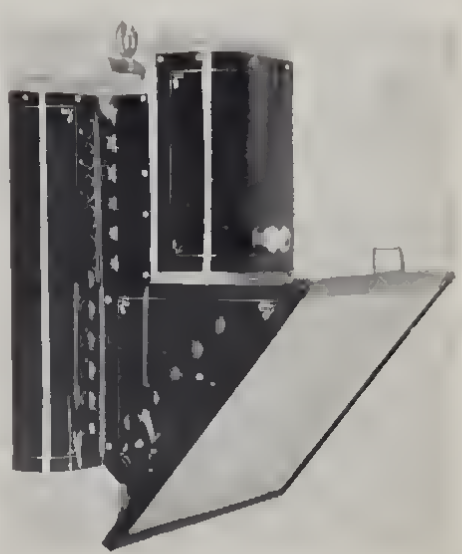
B Spotlighting and Modelling-Lighting Units

1 Eighty Ampere Rotary Arc Spotlight Rotary positive High Intensity arc, motor feed, condensing-lens spotlight Trim: ½"x12" 80 Amp rotary spot positive, 5/16" x9" or $^{3}/_{8}$"x9" copper-coated negative Current 73-80 Amperes, 50-55 Volts at arc Use backlighting and spotlighting

2 Twenty-four-inch Sun Arc (24" diameter mirror) Rotary positive High Intensity arc motor feed, parabolic mirror spotlight Trim 16mm x 18" or 20" H I Positive, 11mm x 10" plated negative Current 135-150 Amperes, 68-72 Volts at arc Use backlighting and spotlighting

3 Thirty-six-inch Sun Arc (36" diameter mirror) Rotary positive High Intensity arc, motor feed Trim 16mm x 18" or 20" H I positive, 11mm x 10" plated negative Current 135-150 Amps , 72 Volts at arc Use backlighting and spotlighting when highest intensity is needed

Fig 2



James Wong Howe, A.S.C.

James Wong Howe —An Uncommon Artist

by
Harry Burdick

JAMES Wong Howe, by big odds, is probably the most colorful cinematographic celebrity of Hollywood. The remote province of Kwangtung, China, gave him birth. Ten formative years of his boyhood were spent on an Oregon farm with foster-parents who are Irish. Match that, if you can, as background for an ace cinematographer.

While engaged in the practice of his profession, he is wholly American. Delightfully democratic and popular, he is "Jimmy" to everyone. He utilizes the same U.S.A. lenses and chemicals and technical equipment as the most rock-bound Yankee.

But you'll note he proudly includes his Chinese surname, Wang, in his signature. And the straight strains of celestial blood that course his veins dictate his theories of screen art.

In other phrases, his mind and his hands are pure American, his eyes and his heart are of China. Plus the item, as Richard Boleslawski aptly puts it, "There's plenty of Irish, too, in Jimmy."

Since 1917, when he first captured the images of Mary Miles Minter in his camera on the old Vine Street lot of Famous Players, Jimmy has been giving deep, philosophical thought to his profession. His technique is founded on fundamentals amazingly well-defined, sharply-stated and progressive.

He looks into the immediate future with much hope and confidence for his profession. He feels that cinematography to come will escape from its current emphasis of stereotyped photographic technical perfection and graduate into realms of realism. Prevailing stress on technicalities—of light and balance and exposure—freezes out the humanness and naturalness from finished works. They become too exactly nice, too mechanically perfect, with elaborate studio preparation too evident.

The true artist always conceals the effort. He takes his technical perfection for granted; and it becomes but a means, not the end itself. It is as the concert pianist who plays compositions requiring extreme technical skill and impresses his audience with his exhibition of mechanical deftness, compared with the artist who with no noticeable exertion to divert his audience makes sweet music.

Screened photography, to Jimmy, should never be obtrusive, it should not screamingly clamor for notice. Its perfection should be so unassumingly perfect as not to pull audience attention from the unfolding drama. It should be as a well-dressed woman—reticent, confident, unobtrusive in her appearance. It should not be conspicuous either for being over-dressed nor under-dressed.

Jimmy wants a scene to look humanly and naturally real, rather than being only a demonstration of the scientific perfection attained by chemists. With the new, faster and better lenses, film and lights available, he can see scenes photographed under actual lighting, a candle-lit table actually lit by candles. Giving truthfulness and fidelity of reproduction from life to the screen.

But don't for a moment hold opinion that Jimmy is a radical or a dreamer. To the contrary, he is simply able to deliver, upon request, celluloided images as mathematically accurate as any of his confreres. His recent work "Flame Within" is an instance. The story is placed in apartments and offices that are gems of interior decoration, each piece precisely placed. The cinematographic treatment is in keeping. It is as though each and every scene had been shot after lengthy consultation with rules and regulations of exposure book and meter. Each is in perfect balance. Each frame of it is technically accurate.

But it is his current work that warms Jimmy's heart and provides scope for his uncanny artistry. It is a circus picture, "O'Shaughnessy's Boy." The majority of scenes are under canvas and it's an actual tent, not a stage set. Jimmy has not exactly designed sets on which to paint mathematically determined shadows. He shoots against that drab gray background and lets the canvas make its own natural shadows.

He has no elaborate superstructure of top lights, and is happy indeed, because he is forced to handle his lighting in a natural, lifelike manner. There's a tendency toward too much back-lighting, anyway, he feels. There's not that much in actual life.

He is letting detail fall away and permitting his coming audiences the enjoyable privilege of using their imagination. He is using no long revealing shots of crowds. Instead he is using close shots, catching the crowds in section, cutting out these sections just as a newspicture camera might.

Continued on Page 341

Training Cinematographers in Russia

Vladimir S Nielsen

by
Vladimir S. Nielsen
President of the Faculty of Cinema Technique,
State Motion Picture Institute,
Moscow, U S S R

As Told to a Staff Writer

FIFTEEN years ago, there was no Film Industry in Russia, today, the output of the Russian studios is equal, in volume at least, to that of Hollywood. At the close of the Revolution, we had no studios worthy of the name, very little equipment, and but a pitiful handful of artists and technicians Today, we have 19 modern studios located in various parts of the Union, using increasingly modern equipment, and manned by a steadily growing staff of trained workers. Forty thousand film-hungry theatres clamour for our product this year, our schedule calls for 300 feature-length productions, with a corresponding number of short-subjects, cartoons, newsreels, and educational films Next year we must make 600, and by 1937, our schedule must be increased to 900 features More studios are to be built, more modern equipment obtained, and more artists and technicians trained

The basic unit of the Russian cinema system is the team of Director and Cinematographer They work together as co-producers, jointly supervising every detail of production, from story to scoring, and sharing in the film's profits Their responsibilities—both moral and financial—are very great, therefore we strive to ensure their success by equipping them with a thorough education in their specialties before putting them to work All our Directors and Cinematographers must be graduates of the State Motion Picture Institute, exactly as Doctors or Engineers everywhere must be graduates of accepted medical and engineering colleges.

The Russian Cinematographer prepares himself by four years of intensive study at the Institute The course is difficult, and the standards exacting less than 65% of those who enter, graduate But when one has completed the course, we know that he has both the theoretical knowledge and the practical experience to prove himself a thorough master of his craft

Entering the Institute, the prospective Cinematographer is expected to have an education at least equal to that obtained in a first-class technical high-school, with sufficient theoretical and practical knowledge of photography so that little time need be wasted inculcating fundamentals He may attend the Institute in one of two ways paying his own expenses (in which event he must usually spend part of his time in self-supporting work), or he may come on a scholarship from his studio—in which event the studio pays his living expenses, etc

The curriculum includes composition, principles and history of Art, chemistry, physics, optics, electrical engineering as applied to studio problems, philosophy, and, of course, both practical and theoretical instruction in the details of Cinematographic work. Cinematography students also study some of the basic studies included in the Director's course, while the Directors, in order to understand the work and aspirations of the Cinematographer, are required to take a brief course in the principles of Cinematography This last also applies to actors, as well, for if they are to appear before the camera, they must know something of the camera and how it affects them

The teachers in our Institute are not mere theorists, but practical exponents of what they teach How else would they have authority to instruct their pupils? The famous Director, Sergei M Eisenstein, for example, is President of the Directors' Faculty, and spends half the year in actual production, the other half in teaching. I am myself an active Cinematographer, devoting six months of every year to photographing films directed by Alexandrov, Eisenstein's former associate Edvard Tisse, who photographs Eisenstein's films, is likewise on the Cinema Technique Faculty

As a graduating examination or thesis, each student of the Cinematographer's course is required to make a short film personally. He must write the story, cast the roles, direct, photograph and edit the production, single-handed The expense, of course, is borne by the school, after all, what better proof could there be of our teaching, and of the student's ability?

Continued on Page 342

PHOTOGRAPHY of the MONTH

"MAKE A MILLION" (Monogram)

Harry Neumann, A.S.C., Directing Cinematographer

Daily Variety (June 19, 1935) "Photography by Harry Neumann is considerably above average"

Hollywood Reporter (June 19, 1935) "Neumann's photography is better than average"

The Film Daily (July 9, 1935) "Photography, Good"

"MEN WITHOUT NAMES" (Paramount)

Ben Reynolds, A.S.C., Directing Cinematgorapher

Daily Variety (June 19, 1935) "Ben Reynolds has handled his camera well"

Hollywood Reporter (June 19, 1935) "Reynolds' photography is good"

The Film Daily (June 29, 1935) "Photography, Fine"

"THE GLASS KEY" (Paramount)

Henry Sharp, A.S.C., Directing Cinematographer

The Film Daily (June 15, 1935) "Photography, A-1"

"MARY JANE'S PA" (First National)

Ernest Haller, A.S.C., Directing Cinematographer

The Film Daily (June 14, 1935) "Photography, A-1"

"CHINA SEAS" (M.G.M.)

Ray June, A.S.C., Directing Cinematographer

Hollywood Reporter (June 24, 1935) "The photography of Ray June taps even his usual high standard. Several of his shots, the lighting on the bridge for instance, should be framed. The storm sequence is a technical wonder."

Daily Variety (June 24, 1935) "Ray June's photography is class throughout"

"HARDROCK HARRIGAN" (Fox)

Frank Good, A.S.C., Directing Cinematographer

Hollywood Reporter (June 25, 1935) "Frank Good's photography contributing to sequences that held a crowded house breathless. It's a workmanlike job throughout"

Daily Variety (June 25, 1935) "Photography by Frank B. Good is particularly effective, especially the underground shots where he has succeeded in giving closeups of tunnel drifting that are both educating as well as thrilling"

Motion Picture Daily (June 26, 1935) "The photography of the great engineering effort by Frank Good is a pictorial delight"

The Film Daily (July 1, 1935) "Photography, A-1"

"BABY FACE HARRINGTON" (M.G.M.)

Oliver T. Marsh, A.S.C., Directing Cinematographer

The Film Daily (June 19, 1935) "Photography, good"

"SYMPHONY OF LIVING" (Invincible)

M. A. Andersen, A.S.C., Directing Cinematographer

The Film Daily (June 22, 1935) "Photography, Good."

"ACCENT ON YOUTH" (Paramount)

Leon Shamroy, A.S.C., Directing Cinematographer

Daily Variety (June 27, 1935). "Photography by Leon Shamroy is eye-filling"

"MAD LOVE" (Metro)

Chester Lyons and Gregg Toland, A.S.C., Directing Cinematographers

Hollywood Reporter (June 27, 1935) "Lyons' photography is excellent and given to the right mood"

Daily Variety (June 27, 1935) "Camera sense is vividly evident behind the excellent photography of Chester Lyons and Gregg Toland. Photographic effects and support of suspense is one of the striking elements of the picture"

The Film Daily (July 1, 1935) "Photography, Best"

"GIRL FROM TENTH AVENUE" (Warners)

James Van Trees, A.S.C., Directing Cinematographer

Hollywood Reporter (June 28, 1935) "The photography by James Van Trees very good"

Daily Variety (June 28, 1935) "Picture has been well photographed by James Van Trees and adequately mounted"

"STRANDED" (Warners)

Sid Hickox, A.S.C., Directing Cinematographer

Daily Variety (June 28, 1935) "Photography by Sid Hickox is excellent"

"WELCOME HOME" (Fox)

Arthur Miller, A.S.C., Directing Cinematographer

Hollywood Reporter (June 29, 1935) "Arthur Miller's camera work is eighteen karat all the way"

Daily Variety (June 29, 1935) "Arthur Miller's photography does full justice to the material"

"ANNA KARENINA" (M.G.M.)

William Daniels, A.S.C., Directing Cinematographer

Hollywood Reporter (June 29, 1935) "Another very special bow to Daniels for his photography"

Daily Variety (June 29, 1935) "Photography of William Daniels is perfect"

"IN CALIENTE" (First National)

Sol Polito, A.S.C., Directing Cinematographer

The Film Daily (June 26, 1935) "Photography, A-1."

Hollywood Reporter (July 5, 1935) "Sol Polito does some minor wonders with the photography"

Daily Variety (July 5, 1935) "Sol Polito's photography is his usual workmanship accomplishment"

"SPRING TONIC" (Fox)

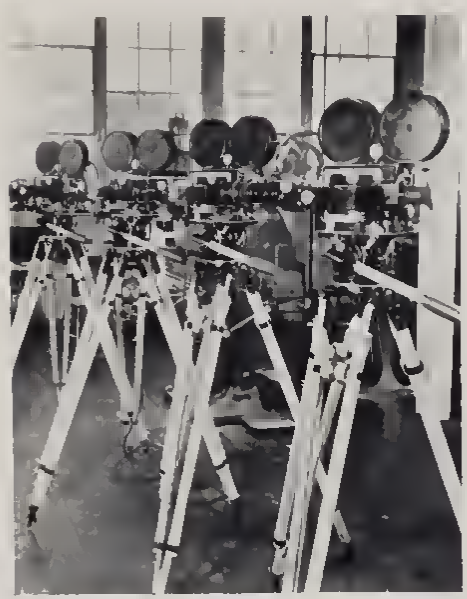
L. W. O'Connell, A.S.C., Directing Cinematographer

The Film Daily (June 26, 1935) "Photography, Good"

"ALIAS MARY DOW" (Universal)

Joseph Valentine, A.S.C., Directing Cinematographer

The Film Daily (June 29, 1935) "Photography, Good"



A group of four Mitchell Cameras recently purchased by the U. S. Navy Air Corps.

"LOVE ME FOREVER" (Columbia)
Joseph Walker, A.S.C., Directing Cinematographer
The Film Daily (June 28, 1935) "Photography, A-1"

"BLACK SHEEP" (Fox)
Arthur Miller, A.S.C., Directing Cinematographer
The Film Daily (June 28, 1935) "Photography, A-1"

"DINKY" (Warner Bros.)
Arthur Edeson, A.S.C., Directing Cinematographer
The Film Daily (June 28, 1935) "Photography, Good."

"IN OLD KENTUCKY" (Fox)
L. W. O'Connell, A.S.C., Directing Cinematographer
Hollywood Reporter (July 1, 1935) "The photography of L. W. O'Connell is of on equally high standard"
Daily Variety (July 1, 1935) "Excellent photography by L. W. O'Connell"
The Film Daily (July 5, 1935) "Photography, A-1"

"ESCAPADE" (M.G.M.)
Ernest Haller, A.S.C., Directing Cinematographer
Hollywood Reporter (July 2, 1935) - "Ernest Haller's photography equals anything he has ever done"
Daily Variety (July 2, 1935) "Photography of Ernest Haller is a workmanlike job"
The Film Daily (July 6, 1935). "Photography, First Class"

"FRONT PAGE WOMAN" (Warners)
Tony Gaudio, A.S.C., Directing Cinematographer
Hollywood Reporter (July 2, 1935) - "Photography by Tony Gaudio is topnatch as usual"
Daily Variety (July 2, 1935). "Tony Gaudio's photography is perfect"
Motion Picture Daily (July 3, 1935) - "The Camera Work of Tony Gaudio is good"
The Film Daily (July 11, 1935) "Photography, A-1"

"SHE" (Radio)
J. Roy Hunt and Vernon Walker, A.S.C., Directing Cinematographers
Hollywood Reporter (July 2, 1935) "The credits for the picture lie mainly with the photography of Roy Hunt and Vernon Walker"
Daily Variety (July 2, 1935) "Picture's chief merits belong to J. Roy Hunt for his camera work and Vernon Walker for his striking photographic effects"
The Film Daily (July 8, 1935) "Photography, Fine."

"UNKNOWN WOMAN" (Columbia)
Henry Freulich, A.S.C., Directing Cinematographer
Hollywood Reporter (July 2, 1935) "Henry Freulich's photography is okay"

"PAGE MISS GLORY" (Cosmapolitan-Warners)
George Folsey, A.S.C., Directing Cinematographer
Hollywood Reporter (July 3, 1935) "George Folsey's photography is excellent"
Daily Variety (July 3, 1935) "George Folsey's photography is swell"
The Film Daily (July 8, 1935) "Photography, Fine"

"DON'T BET ON BLONDES" (Warners)
William Rees, A.S.C., Directing Cinematographer
Hollywood Reporter (July 5, 1935) "The scenes are short, swift and sure with full advantage taken of the camera's flexibility in story telling. Photographer William Rees has even worked out some split screens to help maintain tempo. Photography top notch"
Daily Variety (July 5, 1935) "William Rees' photography is up to standard"

"THUNDER IN THE NIGHT" (Fox)
Bert Glennon, A.S.C., Directing Cinematographer
Hollywood Reporter (July 5, 1935) "The photography of Bert Glennon is way above average as is the rule with this canny cameraman"
Daily Variety (July 5, 1935) - "Bert Glennan handled the camera effectively"

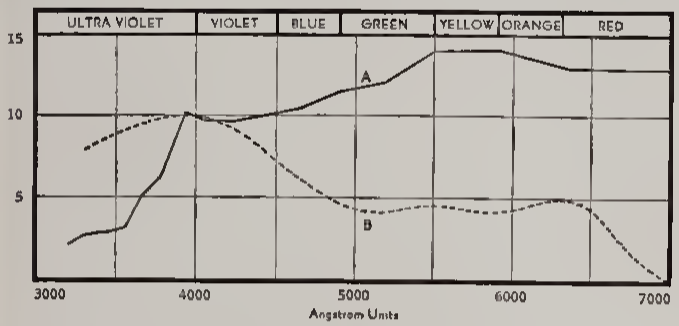
"WHAT PRICE CRIME" (Beacon)
Harry Forbes, A.S.C., Directing Cinematographer
Hollywood Reporter (July 5, 1935) "Harry Forbes has done some outstanding shadow photography in the opening sequence and the rest of his stuff is first rate"

"MURDER MAN" (M.G.M.)
Lester White, A.S.C., Directing Cinematographer
Hollywood Reporter (July 6, 1935) "White's photography is okay"
Daily Variety (July 6, 1935) "Photography by Lester White and general technical contributions are of excellent quality."
The Film Daily (July 9, 1935) "Photography, A-1"

"SILK HAT KID" (Fox)
Daniel Clark, A.S.C., Directing Cinematographer
Hollywood Reporter (July 6, 1935) "Daniel Clark's photography and production standard"
Daily Variety (July 6, 1935) "Photography up to standard"
The Film Daily (July 9, 1935) "Photography, Good."

"DRESSED TO THRILL" (Fox)
Rudolph Mate, A.S.C., Directing Cinematographer
Hollywood Reporter (July 6, 1935) - "Rudolph Mate gave the sequences a fine photographic interpretation"
Daily Variety (July 6, 1935) "Photography of Rudolph Mate is excellent"

BALANCE YOUR LIGHT AT THE SOURCE



Curve A—Energy Distribution from the new 40 ampere Studio Carbon Arc
Curve B—Color Sensitivity of Supersensitive Panchromatic Motion Picture Film

STUDIO lighting that is over-strong in yellow, orange and red must be supplied in excess of actual need in order to obtain the required strength of blue and green. The excess colors can be absorbed by filters to obtain balanced color tones on the negative but the excess heat is absorbed by the actors on the stage—much to their discomfort.

NATIONAL MOTION PICTURE STUDIO CARBONS

PROVIDE STUDIO LIGHTING THAT IS BALANCED TO THE COLOR SENSITIVITY OF MODERN, HIGH SPEED, PHOTOGRAPHIC EMULSIONS

There is no need for speed-absorbing color filters.

They project less than one third as much heat onto the stage as other sources of studio illumination operated at the same photographic intensity.

The new studio carbon arc lamps, using National Motion Picture Studio Carbons, are clean, quiet and steady in operation.

NATIONAL PHOTOGRAPHIC CARBONS

THERE IS NO DETERIORATION WITH AGE
THERE ARE NO UNTIMELY OUTAGES

A high percentage of their radiant energy is concentrated within the most effective range of photographic sensitivity. They provide the maximum of COOL photographic light, BALANCED AT THE SOURCE for the requirements of the camera.

MORE SPEED

•

LESS HEAT

•

A BETTER LIGHT FOR BLACK and WHITE

•

A NECESSITY FOR COLOR

•

NATIONAL CARBON COMPANY, INC.
Carbon Sales Division, Cleveland, Ohio
Unit of Union Carbide UCC and Carbon Corporation
Branch Sales Offices: New York • Pittsburgh • Chicago • San Francisco

Give this new light a trial ✓

Photographic Possibilities of Polorized Light

Continued from Page 331

the subject with plane polarized light Another such device at the camera lens permits photographing by the diffusely reflected light alone, as is shown in Fig 3 This is desirable in many cases, because the specularly reflected light or glare obscures more or less the detail that it is desired to record It is obvious from Fig 3 that if the Pola-screen at the camera is rotated, some of the specular light will be allowed to pass through, so that the amount of reflection permitted is under the control of the photographer When the camera Pola-screen is rotated so that its polarizing plane is actually parallel to that of the specular ray, this ray is transmitted even more freely than is the diffuse ray, so that the subject appears to have even brighter reflections and more gloss than it actually does have

Plane polorized light, or light that is partiolly plone polorized, is very common in nature, so that the photographer who is equipped with o Polo-screen only on his camero lens finds thot he hos rother consideroble control over contrasts in his subject, even though he is unoble to chonge the lighting of his subject There ore two sources of polorized light in noture (1) Light rays from o clear blue sky, arriving ot right ongles to the sun's rays, ore strongly polorized (see Fig 5), when this same skylight is specularly reflected from water, etc, these reflected roys are olso polorized (2) Ordinary, unpolorized light, specularly reflected from ony nonmetallic surfoce at obout 32 degrees to the surfoce, is strongly polorized by the oct of reflection (see Fig 4) There is some effect at other angles, but more ot zero or 90 degrees

These two sources, seporotely and in combination, polarize much of the light from notural things Unoided, our eyes do not detect polorized light, and so we have not seen until now that much of the light from our surroundings is polarized Many noturol things, seen through the Polo-screen, assume o new ond stronge beauty

These effects con be photographed eosily with o Pola-screen over the lens olone It will pay the photographer to view his subjects, both in the studio ond outdoors, through o Polo-screen, while rotating it to see the effects

Properties of the Polo-screens Useful in Motion Picture Work

A Polo-screen over lens olone— (1) Reducing polarized skylight to bring out clouds ond other objects A very dork sky con be obtoined in color photography by this means which is impossible to ochieve otherwise The effect is greatest ot right ongles to the sun's roys Therefore, ot sunrise the regian of greatest effect is north—overhead—south, at noon—near the horizon in all directions, and at sunset north—overhead—sauth again The arc swings from overhead to the west during the morning, from the east to overhead in the afternaon, passing through every part of the sky

Ordinary objects, faces, blossams, trees, mountains, buildings, etc, can be made to stand out against the sky in a very beautiful manner If desired, the brightness of the sky may be increased relatively to objects photagraphed against it, by rotating the Pola-screen to the appropriate position In black-and-white photography, the Pola-screen can serve as a filter of variable depth—anything from red filter effects (without distortion on tone values) down to one filter effects may be obtained by rotating the Pola-screen to the desired position

(2) Chonging the contrast of voriaus ports of o subject, without changing the lighting This effect is very marked in the case of the walls ond roofs of buildings, sunlighted woter, ond povements from obave

(3) Photographing subjects in woter, from above When the ongle between lens axis ond water surface is obout 32 degrees, oll reflections from the woter surface ore eliminoted Reflections may be removed to some extent at other ongles, but not at zero or 90 degrees

Photogrophy through gloss or othei tronsparent medio As in the case of water, at 32 degrees from the surfoce, reflections can be completely removed This effect can be used to produce double exposures by placing a thin pellicle mirror in front of the camera lens ot the required ongle, and rotating the Polo-screen ot the lens The image reflected by the pellicle mirror appears or disappears occarding to the ongle of the Polo-screen Other more obvious opplicotions will suggest themselves, such as photogrophy of aquaria, through windows and so on

B Polo-screens over both lens ond lights.— (1) Subduing specular reflections from metallic ond other glossy objects Metollic reflections can not be eliminoted entirely, but con be subdued very greotly Reflections from most other objects con be eliminated if desired The Polo-screen over the camera lens is crossed with those over the lights for the greotest effect

(2) Increosing specular reflections Articles moy be mode to oppear unnoturolly glossy The change, while consideroble, is not os greot as that possible in the opposite direction The polarizing cells ore used porollel.

(3) Increasing color saturation By removing the surface reflection, which is white, the colors of an object increase in their saturation, that is, their purity The crossed arrangement produces such effects

(4) Effects upon faces The crossed position produces a strange matte effect, with no luster whatever, and the facial colors are exaggerated The parallel position has the opposite result—a very perspiry appearance, with the colors subdued

(5) Photographing wet objects The surface reflections from wet objects, such as clinical specimens, present a severe problem, as they hide detail These reflections may be subdued as desired, or eliminated at the crossed position

(6) Copying matte prints, pencil sketches, newsprint reproductions, and paintings Matte prints reflect light specularly in all directions When this specular component is removed the blacks of the print become much blacker, so that the use of crossed Polascreens produces a brightness range in the print that is even greater than that of a glossy print viewed in the normal manner Likewise, the reflections can be removed from pencil graphite and ink particles, producing intense blacks

(7) Animation cells Reflections from cells used in animation work build up with successive layers so that contrast is seriously affected, limiting the number of cells which may be used These reflections may be greatly reduced by the crossed arrangement of Polascreens

(8) Bi-refringent crystals and fibers The phenomenon known as birefringence causes any transparent object, possessing the property, to light up, frequently in vivid color, when placed between two crossed Polo-screens Cellophane, silk, cotton wool, and many natural crystals have this property

(9) Strained glass and celluloid Any strained transparent medium displays bi-refringence, and when placed between crossed Polo-screens, shows a strain pattern

C. Applications in Lighting and Printing.—The variable transmission of two Pola-screens together suggests a number of possibilities Two Polo-screens meant for lens used together constitute a variable neutral density filter, which may be of interest in making fades in some cases The arrangement can be used as an intensity control in a printer, and has the merits of simplicity, moreover, it does not cut down the area of the beam

Two light-source Pola-screens together can be used for controlling spotlight intensity Cellophane added between these units introduces various color effects

Various lightings are possible with one Polo-screen over the lens and others at the lights It is possible to place a back light so covered directly in the camera field It is also possible to control the light reflected from any light so covered A control, at the camera, is thus provided It is therefore possible to photograph the same set with two cameras and obtain quite different lighting effects

Technical Data

The Eastman Polo-screens have a spectral range of polarizing power from 400-700mu They absorb in the ultraviolet, and transmit freely, without polarization, in the infrared They can be damaged by excessive heat, by placing them within a few inches of a lamp bulb, or imaging a lamp filament upon them

The most suitable negative materials are the panchromatic materials now in general use While it is possible to use the Polo-screens with orthochromatic or even with non-color-sensitized materials, the exposure increase is very much greater

The exposure increase, for the Polascreen over the lens alone, is about four times For Pola-screens over both lens and lights, the exposure increase is ten times and upwards, depending upon the nature of the subject When using a photoelectric type of exposure meter, the Polo-screen for the lens may be held over the meter window at the intended angular position of the Polo-screen The meter should always be used at the same angular position, as some of these meters are slightly polarizing in their sensitive element

If calibrated angular scale is desired for repeating and recording settings used for Lens Pola-screens, the following is suggested

	Scale Angle	Scale Fig	Effect
Parallel position	0	0	Increased gloss
	45	1	Neutral
	60	2	Decreased gloss
	70	3	"
	76	4	"
	80 5	5	"
	84	6	"
	86 5	7	"
Crossed position	90	8	"

The intervals of this scale will be of equal effectiveness in cutting down the polarized light entering the Polo-screen

The Pola-screens have a slight scattering power, so that those for lens use must be screened from all extraneous light by a proper lens hood The Polo-screens supplied for light-source use are not suitable optically for lens use

The novelty of this subject makes it difficult to say just what application will be of most value in motion picture work It is, however, a new tool, by which new effects may be achieved, and its limitations are imposed only by the imagination of the user We are indebted to Mr E H Land for help and suggestions, and to Dr L A Jones for the demonstration film of polarization phenomenan in crystalline structure

James Wong Howe

Continued from Page 334

His close-ups are decidedly interesting Seldom do they show the character's entire face One may be cut off just above the eyes, another cut off at the side For close-ups, only that facial area from eyes to chin are of value to Jimmy, mainly the eyes So why make portraits of the style set by artists of centuries back?

As with all great artists, Jimmy has creative courage, he dares to do He has a scene where two characters discuss their fear of the circus tiger. Instead of placing his characters in front of the tiger's cage and coming in with a close-up of them, he moved his characters far away from his camera, backed against the tent sidewalls And with his lights,

threw a dark shadow of that tiger restlessly pacing to and fro against the gray background The characters tell of their fear and unknown to them, but very much known to the audience, the object of their fear is stalking in shadow above them The scene holds intense dramatic value

Jimmy believes in photographing scenes, rather than talking people He believes in photographing his story, rather than sets and actors He believes in showing bits of action as they appear in life, not an studio stages

He doesn't work by set formulae. He is no rubber-stamp On a recent tour through the galleries in Europe, he noticed the old portrait painters, the old masters so-termed, had all done their subjects in studios with a north light coming down at a forty-five degree angle over the artist's left shoulder Of hundreds he saw, only three had light from the right Jimmy's artistic heart fairly cried aloud for a portrait done with a south light, from any angle other than forty-five degrees and not coming over either shoulder of the portraitist

His work is definitely tempered by his ancestry and his study of Chinese art In China a splash of color and a line or two creates a flower A few deft lines creates a mountain He never clutters up his negative with multitude of detail, just because a thoughtful producer has furnished them in event of their being desired.

James Wang Howe, thanks to his birth and training, is an uncommon artist He has so fully mastered the mechanics of his profession as to realize their importance and to let them rest there With such instruments, he sets forth to make pictures that relate story, that unfold drama, that are true and lifelike, that are not photographically conspicuous, that are highest expression of art—life

To him, with his consummate artistry and the searching philosophy of life he has inherited from the earth's oldest civilization, Jimmy's professional future holds limitless promise

And, between pictures, in this roaring community called Hollywood, what do you suppose he does for pastime? He goes to Chinatown and talks Chinese philosophy in his own native tongue with fellow countrymen merchants And he travels, on business To see nature and life, and to file those scenes in his memory to be used someday

Cinematographic works by James Wong Howe rate on appraising and absorbing eye. They invariably possess the inherent charm and appeal of a Ming vase

Training Cinematographers in Russia

Continued from Page 335

Graduating from the Institute, the student goes into the field as a fully-qualified First Cinematographer In the Russian Cinema, we recognize four definite classes of Cinematographers those who are worthy of making the best and greatest films, those assignable only to what you call "programme pictures", those suited to short-subjects and comedies, and those fitted for newsreel and similar non-dramatic filming The salaries the men receive, incidentally, are dependent upon their classification, with the men capable of turning out the best work reaping the largest rewards Students at the Institute who fail to graduate become Second Cinematographers —or Operatives, as you call them here

It is during these years at the Institute that the majority of our Director-Cinematographer "teams" originate They are not formed by compulsion, we realize that a Cinematographer (or Director) may be able to do brilliant work with an understanding partner, while he would be only mediocre with an unsympathetic confrere Let us say that I, as a Cinematographer, am a romanticist.

clearly, I could not do my best work with a Director whose artistic ideas tended toward surrealism. Therefore, I choose a Director whose ideals are similar to my own Once formed these combinations are seldom broken, though either party is free to join a new partner if he feels that such a change would be beneficial Whatever complaints may arise are adjudged by the officials of the Cinematographers' Association, just as in this country they would be judged by the Board of Governors of the A S C The decision is final

Once a team-mate has been selected, the Cinematographer shoulders his full share of responsibility for the production The two, together, choose the story and supervise its adaptation each scene is carefully planned far dramatic and photographic values—often, the script is broken down into sketches of each angle and set-up so that when the time comes for filming, everything is a known quantity

The Director and Cinematographer plan the budget and schedule together, and submit it for the approval of the authorities As a rule, the average budget far a feature film is about 700,000 roubles, and the authorities are very generous in the matter of schedules, realizing that some films necessarily require more time than others schedules may range from a few weeks to a year or more

Once the budget and schedule are approved, the necessary money and other facilities are placed at the disposal of the Director and Cinematographer, and filming begins The sole requirements are that they adhere to the story submitted, stay within the allotted budget, and deliver the picture on the day they have promised to Otherwise their hands are free, and since they themselves have made the budget and schedule, they are expected to know their business well enough to estimate them accurately

The Cinematographer, in addition to directing the photography of his film, collaborates with the Director in the "Montage," or editing We have no film-editors in Russia if a Director can't cut his own film, we do not think him worthy of being a Director

When the picture is released, the Director and Cinematographer usually with the scenarist and musical composer, participate in its profits, dividing between them 3% of the gross receipts This percentage can often be a very sizeable sum "Chapayev," one of the most successful of recent films, has grossed 22,000,000 roubles, I, myself, in the last two months before I left Russia, received over 12,000 roubles from films I had photographed

Like those of your American Cameramen who are under contract to the various studios, the Russian Cinematographer receives his salary throughout the

year There is, however, no rigid compulsion that he must rush from one production to the next, he is expected to work as continuously as possible, but to select stories that will enable him always to do his best work

By law, our production-units are forbidden to work more than seven hours per day, except on occasions when the entire troupe expresses a wish to work longer in order to complete a scene or sequence

Each Cinematographer receives a two-month vacation each year One month of this period is his own, to do with as he will, the other, he is required to be in Moscow attending the Institute, in order to keep abreast of the latest developments of his Art It may be mentioned, incidentally, that if he works in one of the more distant studios, and chooses to vacation at some resort which will take a long time to reach, his travelling-time is added to the vacation, so that he gets his full time of rest

Technically, our Cinema Industry in Russia is not too greatly different from yours in America Our studios are similar, but rather more durably constructed of concrete and steel, since we had the advantage of building them from nothing, and recently Like you, we use Incandescent lighting almost exclusively though we have arcs for those who want them Most of our lighting units are European, many are Russian-built Until quite recently, we used only Agfa film, but of late we have been importing quite a bit of Eastman's excellent product A Russian film-factory has been established, and produces some panchromatic film, though not as yet in sufficient quantity to meet all our needs

Chas. Stumar Passes

● Charles Stumar, A S C , ace cameraman with the Universal Studios, was killed instantly on June 29th when his plane smashed up at Calabasas, California where he was attempting to land with Harrison Wiley, art director, to inspect a location for a scene in "Storm Over the Andes" which he was currently photographing

Stumar left a wife, also a brother John, who is one of the directors of cinematography at Columbia studio

Among some of the recent pictures on which Charlie Stumar worked are included ' Werewolf of London,' "Transient Lady," "Manhattan Moon" and "Mr Dynamite "

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AMATEUR MOVIES

August, 1935
PRICE 25c

this issue

HOW TO GIVE YOUR MOVIES EVERYTHING A FILM CAN GET

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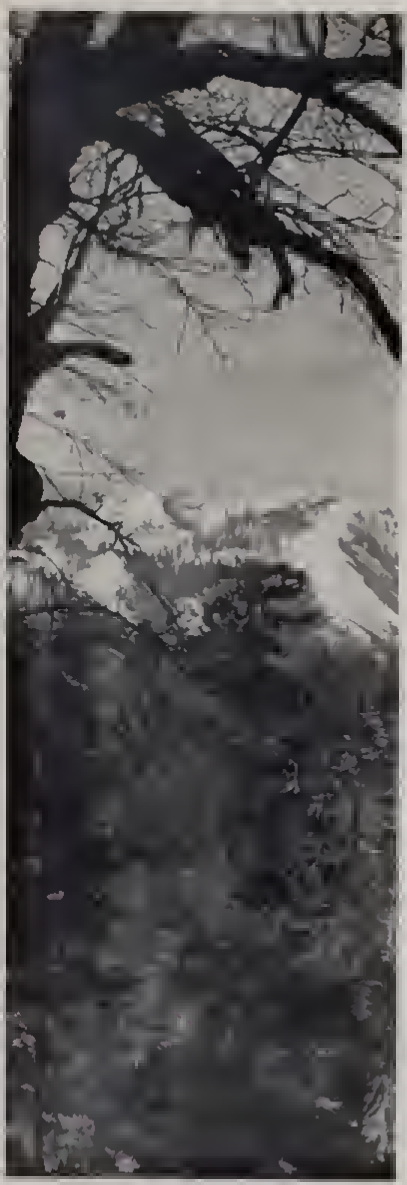

AMATEUR MOVIE SECTION

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Next Month . . .

● We will tell you something about editing You have finished a full summer of shooting There will be much footage on hand that will need cutting and editing Editing is possibly more important at times than the actual shooting for the producing of interesting films Of course a clever editor can make an interesting film out of practically nothing by the right kind of cutting and the proper editing and sometimes by the shooting of an additional scene or two

PROFESSIONAL Criticism of the Amateur picture is a part of the service offered by the AMERICAN CINEMATOGRAPHER. Many are not aware of this. Hundreds of pictures have been reviewed this past year by members of the American Society of Cinematographers for the Amateur.

When You

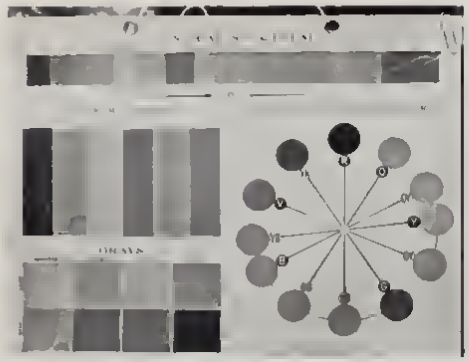


Fig 1

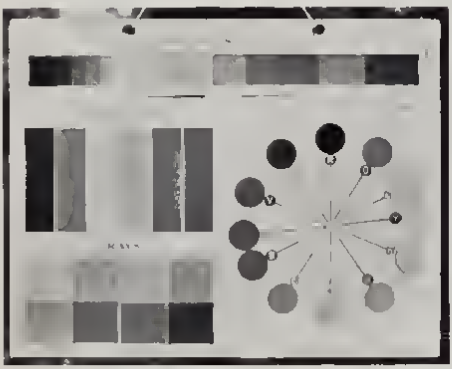


Fig 2

"USE a Filter!" seems to be the favorite phrase of ninety-nine out of every hundred writers on amateur cinematography. Experts, semi-experts and quasi-experts alike, they all harp lovingly on the phrase as though the use of a filter were a panacea for all the ills that beset amateur cinematography. It's all very well meant, but often rather confusing to the fellow with an amateur cine-camera. There seems to be such a bewildering array of filters—and each writer boosts his personal pet filters, regardless of what his fellow-scribes may favor. "Use a K-2!" adjures one—"Always a 'G'!" says another—"A 23-A is best!" advises a third—"A 2x for best results!"—"An X-2 is perfect!"—and so on, 'till the poor reader is as dizzy as a dervish. And as if that weren't enough confusion, the various makers of filters—especially those catering to the amateur trade—are equally vague in their methods of designating their products. Between them all, experts and manufacturers together, the poor movie-maker is so bewildered that, in self-defense, he throws away his filters and swears never again to wonder into such a maze.

The most unfortunate part of the whole situation is the fact that filters, rightly used, can be of tremendous benefit to the photographer or cinematographer. But we must separate the bunk from the facts—substitute understanding and common-sense for ignorance and blind faith. We must know definitely what filters do, and why they do it, if we are to know when and how to use them.

A photographic color-filter is, in the first place, a bit of colored glass or gelatin placed between the film and the object being photographed. The most convenient way to do this is to fit the filter into a mount that can be attached to the lens. But what does this bit of tinted glass do—how and why does it work?

To understand this, we've got to know something about the nature of the films we use. To put it simply, a film—of any type—consists of a strip of celluloid which forms a base to hold the picture, and a coating of gelatin in which is mixed a rather complicated chemical compound of silver, called the "emulsion," and which is sensitive to light. The whole science of photography is based on the fact that certain chemical compounds containing silver are chemically changed by exposure to light. Even before the invention of photography itself, physicists observed this phenomenon, and they also observed that the action of light upon these compounds was in direct ratio to both the intensity of the light, and to the color of the light. Over a century ago, for instance, Sir Humphrey Davey noticed that such compounds were quite strongly affected by blue light and hardly changed at all by red light. For over three-quarters of a century, photographic emulsions maintained this preference, then certain researchers discovered that they could produce emulsions which were not quite so color-blind, as they were somewhat sensitive to yellow and green light, too, optimistically, they called their new emulsion "Orthochromatic," from two Greek words signifying 'true color.' More recently, they have learned how to make their emulsions "see" red light, as well, and they called this product "Panchromatic," as it is sensitive to all colors.

Now, translating these facts into terms of photography, an Orthochromatic film sees red as black, green as a very dark grey—almost black—yellow as a light grey, and blue as so pale a grey that it is virtually white. Not at all the way our eyes would see the same colors! A Panchromatic film, on the other hand, approaches the interpretation of our eyes much closer: the red is still the darkest, the blue is a moderately dark grey, and the yellow is quite a light grey. Fig. 1 shows how a typical Panchromatic film (Eastman regular Panchromatic) interprets a set of standard colors.

That is all well enough—but often we may want to change this for one reason or other. So we use a color filter, which, as its name implies, filters out some of the light. Since the filter takes away part of the light, without putting in anything to replace it we must increase our exposure to compensate for the lost light. This gives the colors which pass through the filter a chance to work more strongly and gives us a well-exposed picture, in which the weaker colors have registered more strongly than usual,

Filter Use Common-Sense

by
William Stull, A.S.C.

RED FILTERS lighten reds greatly, orange and yellow even more, darken blue strongly, and have relative y little effect an greens

GREEN FILTERS lighten greens considerably, darken red, and leave blue and orange unchanged, though yellow is lightened.

These facts apply to all filters of these respective colors, regardless of the make or name however, the darker the color of the filter, the more pronounced its action—and incidentally, the greater must be the increase in exposure to compensate for the filter

Now to apply them to practice!

Suppose we have a landscape, with nice, fluffy clouds against a blue sky in the background, and a girl wearing a yellow dress in the foreground We want to make the girl stand out against the green grass, and we want the white clouds to stand out against the blue sky Ordinarily, the yellow dress would be a little lighter than the green grass, but the intense blue of the sky would photograph almost white, and we would lose the clouds So we can use a yellow filter; the girl's dress will become noticeably lighter, and the sky will darken enough to make the clouds stand out rather well

But suppose we want to carry this farther a red filter will darken the sky much more—even making it almost

Continued on Page 364

and are accordingly shown in lighter tones in the completed picture

Since the very earliest emulsions were overly fond of blue light, the first color-filters were made of yellow glass, which—according to the color-density of the glass—held back the blue, and often the invisible, but photographically powerful, ultra-violet These filters helped, for they made the blue parts of the picture darker, and showed the yellows more nearly as the eye sees them, as a light shade, they also lightened the greens somewhat They act the same way, though to a different extent, with Panchromatic films Fig. 2 shows the action of a medium yellow filter (the Wratten "K-2") with this type of film You can see that the red is still very dark, and the yellow has become quite light, while the blue is noticeably darker, both orange and green are also appreciably lightened

But, suppose we want either to make the reds lighter, or to darken the blues—what then? A deeper yellow filter, which, of course, holds back more of the blue light, will darken the blue—but it won't change the red very much But, remember, the yellow filter made the yellow photograph lighter—so why wouldn't a red filter lighten the reds? It will! Fig. 3 shows what a rather heavy red filter (the Wratten F, No 29) will do The red has changed from black to a light grey, orange and yellow are almost white, green is slightly darker—and the blue has become a very dark grey.

Now, suppose we want to make the green lighter? Clearly, neither a yellow filter, nor yet a red one, will do the trick What will a green one do? Fig 4 shows us, it was made on the same film, with a medium green filter (the Eastman "X-2") The reds have become much blacker, blue and orange are virtually unchanged, yellow is still quite light—and our green has at last become a very light grey

From all of this, we can make out the following facts about filters, which can give us the key to almost any filtering problem

YELLOW FILTERS lighten yellows considerably, also orange and green to a lesser extent, darken blues, and leave red virtually unchanged

Fig 3

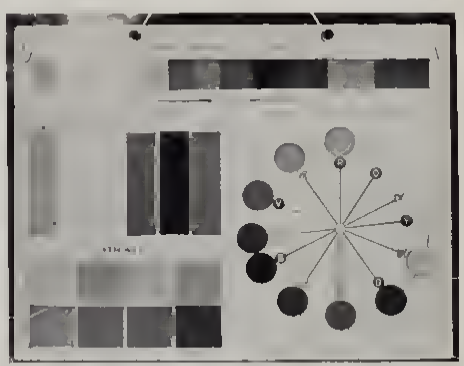
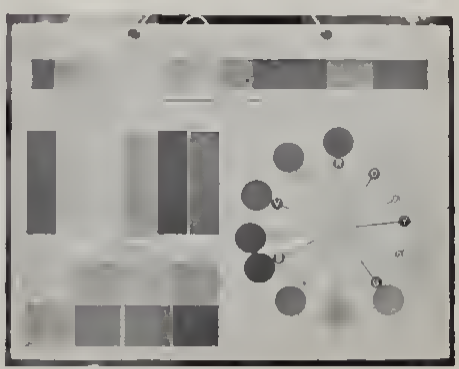
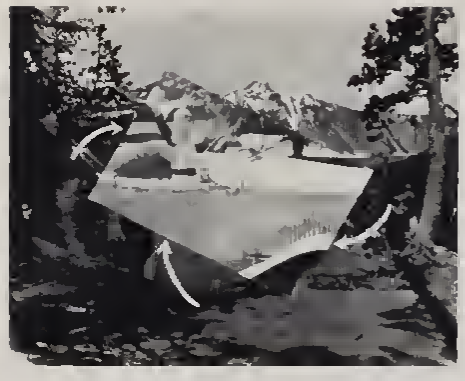


Fig 4



Traveling



This wipe off effect swings in from each corner as arrow indicates wiping automobile off with wooded scene.

WHEN the Children of Israel marched through the Red Sea in "The Ten Commandments," it was the "traveling matte" system of trick photography that made the shot possible. A miniature shot was made of the watery canyon through which they were to march, then a separate shot of the marchers, against a plain black background. From this latter negative, two special mattes were made, one, which we can call the 'negative matte," in which the moving figures were sharply silhouetted against a clear blank field, and a complementary 'positive matte," in which the field was opaque while the figures were clear. The final scene was made in two printing operations: first the background was printed through the negative matte, which left the spaces occupied by the actors unprinted, next, the figures were printed in through the positive matte, which shielded the background, but let the figures print through normally.

Of course, while a shot like that could conceivably be made in 16mm., it isn't quite the sort of thing that the average amateur would find useful in his own pictures. Besides, getting an opaque matte from an ordinary negative requires some rather tricky developing and intensifying. But the travelling matte idea can liven up any home movie by putting in "wipes" and similar professional effects.

All that is necessary is a camera, a title-board, and a good printer. To get the best results, you really ought to do the laboratory work yourself, but as you will seldom be dealing with scenes more than ten feet long, this is a simple matter. Of course, all of this presupposes the use of negative-positive, though once you've gotten your hand in, you could make dupe negatives from reversal-film shots and use the dupe like an original negative.

To begin with, let's take the simplest sort of "wipe-off," and see how it's done. Scene A is on the screen, scene B appears at one side of the frame, and pushes A off to one side as scene B moves in. First, we make a matte. We set up the title-board with a WHITE card in place, and shoot the required footage of that, then we take a dead BLACK card and slowly slide it in from the side while the camera grinds, and we continue to photograph the black card until the footage for scene B has run out. This photographing, incidentally, is best done on positive film, which is cheaper—and more contrasty. For developing the matte, we need a developer which will give extreme contrast, so that the black areas will be absolutely opaque. I think Eastman's 'D 9' developer is about the best. Here's the formula:

Stock Solution A.

Water (about 125° F.)	16	ounces
Sodium Bisulphite	¾	ounce
Hydroquinone	¾	ounce
Potassium Bromide	¾	ounce
Cold Water to make	32	ounces

Stock Solution B.

Cold Water	32	ounces
Sodium Hydroxide (Caustic Soda)	1¾	ounces

Cold water should always be used when dissolving the caustic, as considerable heat is involved. Solution A should be stirred thoroughly when mixing with Solution B, to avoid precipitation. For use, mix equal parts of A and B, and develop two or three minutes at 65° F. Wash the film thoroughly between development and fixing to prevent stains and chemical fog.

So far, we have only one of the two mattes we need—the positive one, which protects the first scene. To make the negative matte we simply make a print from the matte we've just made, and develop it in the same developer for maximum contrast.

In making our "wipe," the first thing to do is to determine a definite starting-point in the raw positive, in our two negatives and in our two mattes, notching the edges of the film at this point, so they can be registered easily. Then we place Matte No. 2—the "positive" matte—in the printer. Over this, we put the negative of the first scene and, last of all, the raw positive for the print. The matte must never be between the negative and the positive, for this would throw the print out of focus.

After the first scene is printed, the positive film is rewound, and the "negative matte"—the one we made first, which begins totally opaque—is put in place. The matte, the negative of the second scene, and the positive film are aligned by means of the starting notches we marked, so that the two halves of the wipe are printed "in step with each other."

After printing through the second matte, the wiped scene is complete and the positive is developed in the usual manner. The same succession of operations is, of course, followed in all types of travelling matte trickery.

Naturally, these basic wipes can be made in any direction—up, down, right, left or diagonally.

The next type of wipe is logically one made with two black cards which open or close like sliding barn doors, pulling apart from the center of the frame, or closing the same way. These wipes, too, can be made to go in any direction, and by varying the shape of the cards, quite a variety of effects can be had. For instance, if the two cards are cut with V-shaped notches in their edges, the effect will be a diamond-shaped iris-in or out.

Another interesting wipe, made with two cards, is made

Matte Tricks with 16mm Negative

by
Paul Lerpae, A.S.C.

with the black cards dividing the frame either vertically or horizontally, and moving in opposite directions If, for example, they move horizontally, the top half of the first scene will start wiping off at, say, the right side of the screen, while the bottom half will start at the left side, and the halves of the second scene will move in these two directions

By using three cards, we can vary this to good effect For instance, we can begin by having the left-hand third of the scene wipe upward, as soon as this is done, the center starts to wipe downward, after which the last strip wipes upward

Another useful wipe is the type which moves fan-wise The simplest of these is made with a single black card, which is pivoted at one corner of the frame (usually the lower right) and swung down into the picture The true fan wipe is, of course, made with two black cards which are pivoted at the bottom center of the frame and swung in or out together If they swing in, scene 2 will wipe in from the edges, like a Japanese fan folding, if they swing out, scene 2 will appear in the center, and spread out as though the fan were opening In the latter case, we would change our method a bit, beginning our matte shot with the black cards in place, and using the negative matte for the first printing

A variation of the fan wipe is to pivot the two cards at the lower corners of the frame, and work them in together. You could also pivot one card at the bottom center, the other at the top center, and revolve them in opposite directions

If you want to carry this idea through to its logical conclusion, use four black cards, pivoting one at each corner of the frame, and swing all four of them in together This is a bit tricky to do (it really takes two very cooperative people to manipulate the cards well), but it gives a very interesting effect

The "melting wipe" has been used very interestingly in several professional films It can be made quite easily, too, in 16mm You simply place a pane of clear glass in front of the white card, with a little V-shaped trough along the top In this trough put some dark, rather heavy oil, and tilt the trough so that the oil runs out all the way across the top edge of the glass Gravity will do the rest, for as the oil runs down the glass, it will run irregularly, and give you the melting matte you want Two things you will have to watch out for first, that your lights are set where they won't reflect in the glass or oil, and that the oil is black enough to be opaque Sometimes you can use crankcase drainings from your car, otherwise you can use any heavy machine oil "Three-in-One" and similar household oils are too light, they would flow too quickly Incidentally, if you can't get oil that is black enough, mix in some lampblack

Continued on Page 362

At top we have the first printing in which the city scene is being wiped off The next photo is the second printing showing the matte opening and the country scene being wiped on The bottom is the finished positive print with the city scene partly off and the country scenes partly on wipes are fanning from bottom center

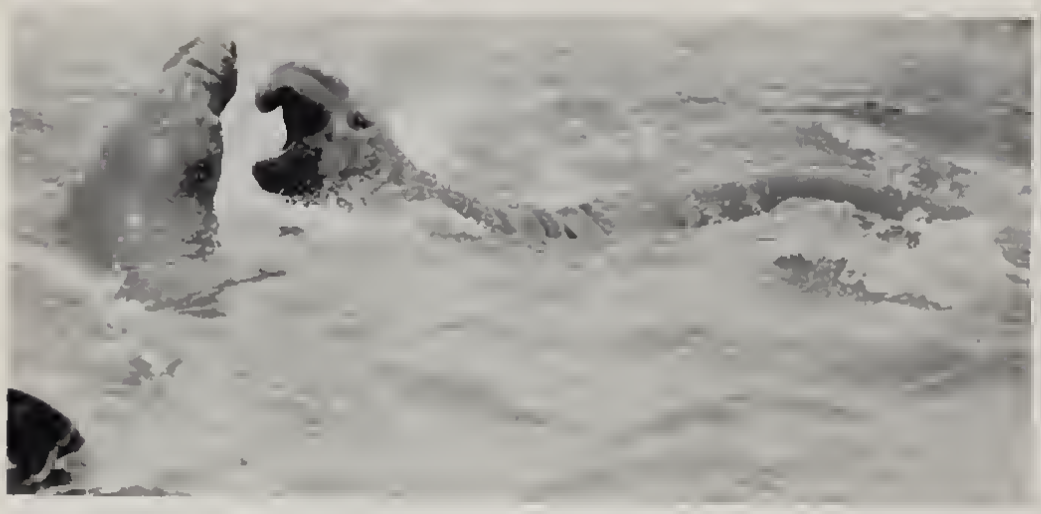


Photo courtesy Hancock Expeditions

Six tons of fighting sea elephants caught by Swett's camera at San Benito Island.

People Want to See His Films

by
Karl Hale, A.S.C.

TWO thousand people jammed the theatre
Three thousand more—outside—turned away for lack of seats

On the screen, a motion picture A silent film, without stars A 16mm film. To be exact, a programme of educational 16mm pictures

And audiences like them! Only this spring, in Quito, Ecuador, an impatient audience swept through a police cordon and rioted into the theatre to see the show And while such a display of enthusiasm is rather above average, even for these films, more-than-capacity crowds are the rule wherever the Hancock Pacific Expedition films are shown

At the same time, educational and scientific authorities—who do not always see eye to eye with lay audiences on such matters—bestow upon these films their highest approval Some of the phrases used by distinguished and conservative educators would excite the envy of a professional press-agent

I don't need to point out that such a combination is rare Quite a few expeditions have brought back films of more or less scientific value, a few have brought back films that managed to tickle the public fancy, but in most cases, scientific accuracy is achieved at the cost of audience apathy—or vice-versa. The great majority, trying to please both factions, succeed only in displeasing both

But when I asked W Charles Swett, who photographs the Hancock Expedition films, what was the secret of making such remarkable films, he was quite sure there was no secret! "We film our pictures in a simple, straightforward fashion, edit them so that each picture tells its story completely, and then we try to present them as pleasingly as we know how," he told me

"Captain Hancock's cruiser, the Velero III, was built especially for scientific exploration On her cruises to the seldom visited corners of the Pacific, we carry with us specialists from the leading universities and museums of the country on the last cruise, for instance, the Smithsonian Institution, the University of British Columbia, the University of Michigan, the University of Nebraska, and the University of Southern California were represented They carry on their researches, I film their work and the results Under such circumstances, one could hardly go wrong on the purely scientific phases of the filming

"Due to the nature of our work, we've found it best to make our pictures with 16mm equipment Most of the time, I have to work in places where there simply isn't room for a larger camera Sometimes, in filming the seals at Galapagos, I have swum and waded a hundred yards or so, camera in hand, to reach a vantage point for a needed shot A standard camera—even one of the so-called 'hand cameras'—would be utterly out of the question

'Then, too, I often have to shoot quickly—or lose a scene I've been seeking for years When two twenty-foot sea elephants are fighting it out a dozen feet from your lens, you haven't time to waste setting up tripods or plugging in battery-cables!

Continued on Page 360

These Things Called "Tricks"

by
Ed Ludes

UNQUESTIONABLY the greatest ambition of the average movie maker after learning to shoot straight pictures is to master the art of "tricking." For no reason that can possibly be expounded there beats within his breast an insatiable desire to have his audience profess great curiosity about how it was done, and of course they will—if they're polite. That scene where Johnny, aged 5, seems to leap up onto a four-foot fence is certainly mystifying but no more so than the one where Sally's doll seems to get tired of sitting in one position and decides to put herself to bed. Ah, that one never failed to elicit the usual "for goodness sake! How'd you do that?" Great stuff! But positive proof that Mr. Movieshooter is an amateur of the first rank—with the accent on the last word. Proof, you say? Well, let's recall some of the things most of us know, but seldom consider.

Perhaps one of the greatest examples of professional trickery was brought to the screen in "The Invisible Man." "King Kong" was another, more pretentious example, and, proving complete trickery in feature length productions isn't new, we submit "The Lost World."

"There," you cry, "doesn't that prove that tricks are in good taste?" We agree, of course. We're not trying to say that tricks should not be attempted. It's the MANNER in which they are presented that irks us.

Take the above mentioned pictures for example. In no instance did the story serve the trick. On the other hand, without exception, the tricks served the story. See the difference? Because these stories were so fantastic audiences could not help but wonder how they were photographed, BUT, (and this makes the difference), shortly after the picture started, the audience lost interest in the photography and became absorbed in the story. Theatre audiences would resent paying admission to see a lot of unrelated camera tricks as an evening's entertainment except, possibly, in the shortest of shorts. Tricks are nothing new to them and cannot hold interest for any length of time without story support. Your modern theatre audience (of which you are a part) is pretty blase. Why, then, expect your guests to be different when seeing your pictures? They'll be polite, of course, but you can't amaze them sincerely by pure trickery. So what to do about it—granting that tricks ARE all right IN THEIR PLACE? The answer is simple.

If Johnny MUST jump four feet and land on a fence give him a reason for doing it. Have the story concern some TARZAN PILLS which he accidentally finds as buried treasure in the back yard. With this as a reason, you can let him do any number of tricks—to the amazement of the rest of the neighborhood kids and the amusement of your guests.

Take the case of Sally's doll. A very interesting picture could be made out of some such idea as this.

Scene opens with Sally changing the dress on her doll. A Fairy Tale book is prominently by Sally's side (highlighted, if possible, to make it prominent). She finishes dressing dolly and sets her at her side in the position in which the doll is to be left. Then she picks up the story book and starts to turn the leaves slowly and thoughtfully. Either dissolve, or cut to a closeup of Sally turning the pages. A very few feet of this then change the angle shooting over Sally's shoulder at the leaves of the book. Sally stops turning at a picture of a fairy touching a little girl with her wand (Cinderella and the fairy would do nicely). Allow time for the audience to grasp the idea then cut to a medium shot of Sally as before, with her still looking at the picture page. She looks up with a far away look and turning to Dolly says

TITLE "I wonder if Dolls have Doll Fairies."

Cut back to Sally as she finishes speaking then turns back to her book. She closes it. Change angle slightly and show Sally yawning. She turns to Dolly again and says

TITLE "Goodnight, Dolly."

A long shot gets Sally out of the picture. Then, with another doll dressed as a fairy, your animation begins and only ends when your patience is exhausted. But you have given a reason and story to your trick. AND THAT MAKES THE DIFFERENCE BETWEEN ENTERTAINMENT AND BOREDOM.

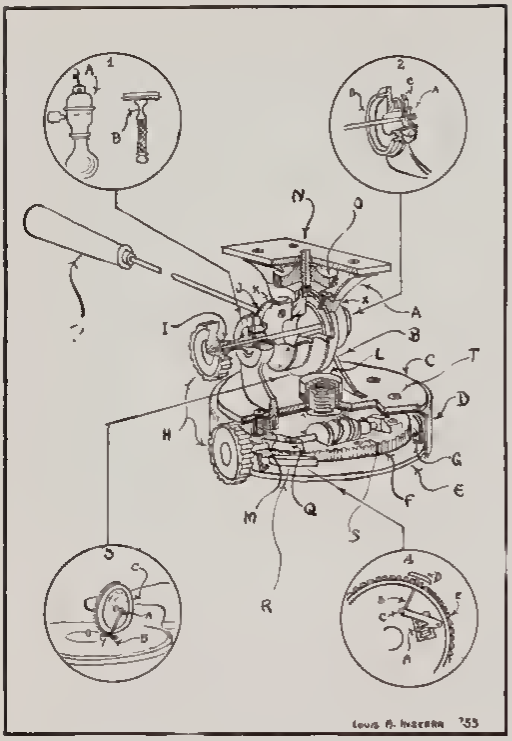


Fig. 1

Making

BEFORE I begin describing the construction of this easily assembled amateur pan and tilt head, I want to state here that there is no more fascinating pastime for the amateur than that of building his own movie accessories, especially when the equipment is derived from unique odds and ends such as are easily found around the home and workshop. No special tools or materials are required for assembling such homemade articles because substitutions may easily be made for parts not easily available.

This pan and tilt head, the construction and assembly of which I am about to describe, has completely satisfied my most rigid requirements. It is rock-steady in performance and affords the photographer smooth working panorama and tilt movements with quickly available controls for locking the camera in any desirable position. Variable tension facilities make it possible for one to set this head to suit his own particular needs, and, as far as looks are concerned, it can be easily mistaken for a product sold at retail.

Aside from the commonplace tools found in the home workshop the following list of tools will also prove useful: one tap and die ¼" U. S. S. 20, one tap and die 8/32 M. S. S., hack-saw, file and hand-drill.

Before mentioning the materials used, I want to impress upon my reader this fact, and that is, the following list of materials is a list of what I found most handy around the home. In building this tripod head you will find that substitutions for parts you may not possess are easily made.

The following is a list of the odds and ends I employed in the construction:

1. An old brass gear-wheel (F).
2. The metal base of an old alarm clock (A).
3. An old phonograph pickup head (Insert No. 3).
4. An electric socket shell (top part only) and neck (brass) of a safety-razor (Insert No. 1, A and B).
5. An old-style Edison pickup device (Insert No. 2, B).
6. Nickel-plated rear bell panel of a discarded alarm clock (D).
7. Bakelite panel (C) and radio knobs (H).
8. Tire valve head and nut to fit.
9. Brass yoke joint found in junk yard (B).
10. Telephone knurled knob joint (O).
11. Aluminum (N) from an old frying pan.
12. Pancake flipper handle (P).
13. Miscellaneous small bolts as found in a boy's Erector set.
14. Pieces of scrap brass.
15. Heavy base of an old electric fan (E).
16. Rear panel of a clock for broke rim (G).
17. Cap from a phonograph needle supply well (K).
18. A worm gear from a boy's Erector set.

As my readers' equipment and materials will vary from the above list I will undertake only to outline the assembly of this tripod head rather than go into any detailed account. Alterations of design are easily effected as may be noted from the diagram. In fact, if desired, the whole pan locking mechanism (Insert No. 4) may be done away with if a gear wheel to suit is not easily found.

My first step was to construct the base of the head. In the center of the gear-wheel a hole was drilled large enough to admit a sawed-off tire valve-head which was bolted to the fan base weight E. The bottom of the base was then filed smooth. Insert No. 4 shows the construction of the panorama lock mechanism. D is a lead shoe well soldered onto the moving rod B. The brass arm C, actuated by the engagement of the tooth A and the worm gear, causes the brake shoe to work back and forth slowly and powerfully through a hole drilled in the side of gear-wheel E. This shoe locks the panorama movements when it presses against the rim G which is permanently bolted to the fan base E. After some experimentation, I found that a strip of adhesive tape placed on the inside of the rim G pre-

a Tripod Head from Odds and Ends

by
Louis A. Inserra

vented any slipping of the lead shoe-brake A spring and bolt adjustment L controls the tension of the pan movement This completes the actual construction of the base proper, and, as I stated before, the base construction can be simplified by doing away with the locking device entirely, although, in my case I found this feature a necessary adjunct to good movies

The construction of the tilt part of this tripod head offered a more complex problem than did the above base construction After experimentation, I found that the safety-razor neck, I, fitted snugly into the threaded part of the electric light socket shell, J Both of these parts are shown in Insert No 1 at A and B The cross-sectional diagram shows how these two parts were bolted to one of the brass uprights Through the piece I a hole 8/32" was bored large enough to admit the shaft onto which was fastened a knurled knob

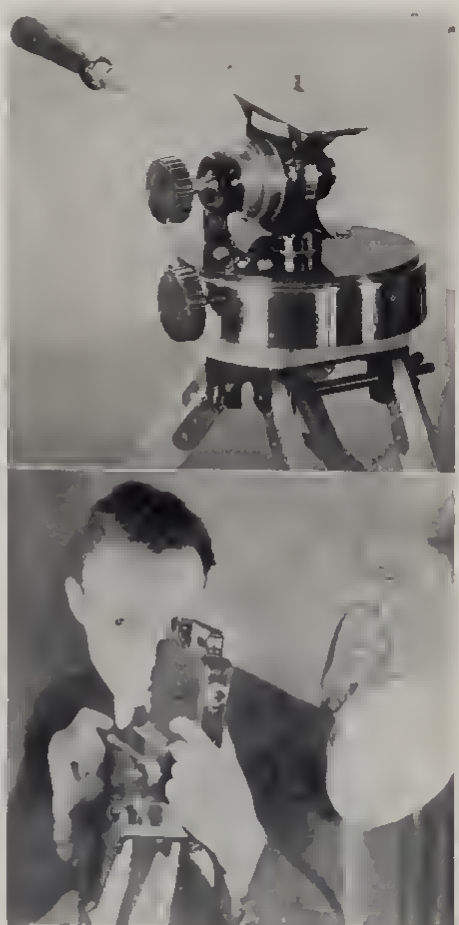
The opposite end of the shaft was threaded to fit a small circular plug as shown at A in Insert No 2 Insert No 2 illustrates the old Edison pickup head permanently secured into a corresponding brass upright by the bolt C Bolt C also permanently secures plug A This completes the assembly of the uprights and fixed portions of the tilt assembly

The revolving parts of the tilt mechanism consist of the cap of a phonograph needle well K bolted to the phonograph pickup K fits snugly over the flange of J, thereby affording a perfect revolving friction movement. The top plate assembly was bolted onto these two parts, as shown at lead filling X The top plate N was cut and shaped from an old aluminum frying pan This was bolted to the clock base A in which a section was removed to admit the knurled knob O The diagram clearly illustrates all of the above assembly

The two brass uprights were bolted to the gear-wheel after a suitable position of balance had been determined But before doing so, two openings were cut into the bakelite panel C and bell panel E so as to admit the two brass uprights This constituted the outer covering of the panorama works and was fastened to the gear-wheel by four bolts well supported with four short pieces of brass tubing as shown at M By this means the bell panel D just cleared the top of the worm-gear A small perfume bottle cap, L, hid from view the nut and spring adjustment of the base. Underneath the base E a standard camera-mount thread was tapped into the small hole of the tire valve.

I have tried to make all the above explanations as brief and simple as possible because a careful scrutiny of the cross-sectional diagram will clear up any dubious or questionable points which may come up

In conclusion, may I suggest that in going about constructing this amateur pan and tilt head, you first determine what available materials you have at hand and then conform your subsequent construction as close as possible to that as shown in the cross-sectional diagram



At top the completed tripod head as described by Inserra. A professional looking job. At bottom the author using his triped head with an 8mm camera.

Cine Story-Telling Pays

by
Walter Blanchard

UNTIL Gus brought out his projector, I had been having a thoroughly enjoyable evening. Gus and I are good friends, and he had been telling me about his vacation in Honolulu, which is a place I've always wanted to visit. Even when he threaded up the film, I still had some hopes, for if all he had been telling me was true, he had a chance for some marvellous shots.

As the projector started to hum, Gus began his manalogue. "Here we are leaving port—that's Tillie, Uncle Ezra is just behind the lifeboat, and Aunt Maggie is just out of the picture. That's a little girl we met on the boat, she's awfully cute, even if she doesn't look it. This is Honolulu—I'm afraid I panned rather fast on that, but it's really very pretty there. Here we are at Kilauea—Yes, that's Tillie beside the car, and the other two are some school-teachers that we met in the hotel. I wish you could see the fire-pits at night. Now we're at Waikiki beach—Tillie made this. Don't I look funny? You ought to see the surfboard riders there, we made a shot of them, but it was on the end of the roll, and we lost it. Oh oh! That's where Tillie stopped me as I was about to shoot the hula-dancers!. .

Ten reels of this, and a beautiful friendship had crumbled. I wanted to see what Hawaii was like—but all Gus showed me was a collection of miscellaneous shots of chance acquaintances that even he will never see again, and that nobody could possibly care a hoot about. Every time he had come to something that I really wanted to see, there would either be some unspeakable oaf clowning in front of the lens blotting out the really important view—or Gus would apologize that he had run out of film just then. If he ever wants to show me any more of his films, he'll have to show me a Supreme Court order—and then call out the police.

And I'm not the only one who has suffered through such an evening. There are thousands of cinefilmers like Gus at large throughout the world. No one is safe from them—or their miscegenate films.

And it is all so completely unnecessary! One-half of one percent of ordinary common-sense applied to the shooting of vacation-films would do the trick.

After all, why do we make such pictures? Isn't it because we feel that the cine-camera can tell the story better than we can ourselves? Then—why not let it tell the story properly?

But don't get me wrong when I say "story," I don't mean that home-movies should all be built around an involved plot, with heroes, heroines, villains and the conventional fadeout clinch! That isn't it, at all. When I tell you, "I visited Yellowstone," and then proceed to describe the geysers, the bears, and the other things I saw, I'm telling you a story, if I'm a good story-teller, my story can be just as entertaining as any fictioned romance.

One of my friends, who is a famous Cinematographer, is fond of saying, "Art is not what—but how." In other words, it is not so important what sort of a story you tell with your cinebox as how you go about telling it.

And there is a story in everything that is really worth filming. In vacation-films, it may sometimes be where you go, or it may be what you are doing. In either case, the way to put the story on the screen is to decide at the start whether the story is a "where" story or a "what" story—and then to shoot your scenes accordingly. In a "where" story, the "what" is of very minor importance—and vice-versa.

Gus' trip to Hawaii was a "where" story if there ever was one. Therefore, to tell it properly, he should have let his camera show us Hawaii—poking its lens into all the unique beauty-spots, and showing us, not the tourists (who are the same everywhere), but the Hawaiians how they live, and dress, and dance, how they eat poi and row fish and ride surfboards. He can film his wife and the rest of the tourists at home, if he simply can't avoid making a few shots of these pests while he is vacationing, he can at least have enough respect for good cine-narration to cut them from the reel before showing it to anybody.

Now—since Gus and his films are both imaginary—let's suppose he and his camera went on a fishing trip somewhere. In that case, his story would be a definite "what" story. Where he went wouldn't be nearly so important as what he did. If you were to ask him questions

Continued on Page 366

WHEELS OF INDUSTRY

New Lights

● Bell & Howell Company has assumed exclusive photographic market distribution of the Aplanatic Reflectors for photoflood bulbs which are manufactured in Los Angeles and used extensively in the Hollywood studios The reflectors distributed by Bell & Howell are small, compact duplicates of the big studio reflectors and comprise a complete line of the sizes and types best suited to amateur movie making and still photography

The mirror-like chromium surface of the Aplanatic Reflectors consists of many facets, each of which reflects the lamp's filament, with full intensity, toward the subject The degree of concentration or spreading of the light beam may be controlled by moving the reflector backward or forward on a sleeve encasing the lamp socket

Reflector bowls 5½ inches and 7½ inches in diameter have wire clamps inside the bowl which slip over a lamp bulb in existing home fixtures These are called Snap-on Reflectors

There are Hand-Clamp Reflectors in three sizes—7½ inches, 8½ inches, and 12 inches A powerful, rubber-covered, spring hand clamp holds the reflector firmly to a chair back, table edge, or window sill A ball-and-socket joint between clamp and reflector permits the lights to be directed as desired

The three reflectors listed above may be had with folding stand rather than hand clamp Stands for accommodating one and two reflectors are offered

New Exposure Meter

● A new photo-electric exposure meter in which sensitivity to light has been increased more than three times over previous models has just been announced by the Weston Electrical Instrument Corporation, Newark, N J It will be on the market within the next few weeks, according to present plans, and will be sold at a lower price

The new meter extends the determination of accurate exposure settings independent of eye-judgment to the lower brightness levels commonly encountered in photographing interiors, in home photography under artificial light, and in candid camera work The widened scope of photographic possibilities resulting from the use of super-sensitive film and high-speed lenses, using such settings as F 2 and 1/10 second, is matched by the light-sensitivity of the new instrument However, it is said to be more compact and more simple to operate than those previously available

A feature of the meter is the redesigned light-value indicator, which accommodates on a single scale a range of brightness values in which the maximum indication is 4000 times the minimum This is accomplished without sacrifice of legibility by spacing out the divisions at the lower end of the scale where exposure determination is most critical The movement of the needle over the scale is of sufficient magnitude so that it need not be held close to the eye

Universal application of the meter to all types of still and motion picture cameras is provided by means of an open-face reference dial including aperture settings from F 1 5 to F 32, shutter speeds from 1/1000 second to 100 seconds, and a range of film speeds from 1 to 64 (Weston rating) Simplified arrangement of the new dial gives a more rapid and convenient indication of "normal" exposure However, a complete indication of the film-density range available for any particular photograph is also shown at a glance, so that the photographer who wishes to depart from "normal exposure" to meet exceptional light conditions or to distort tone values for artistic effect has all the information required

Light entering the meter is restricted to that within the usual lens angle by means of a new type of cell window of glass in the form of multiple lenses, a method which transmits a considerably greater proportion of the light than is possible with the baffles previously standard for this purpose

The photo-electric cell used in the new meter is of the same "dry plate" type first adapted to the photographic exposure problem by the Weston organization The increased sensitivity of the instrument has been obtained without sacrifice of permanent electrical characteristics, according to the manufacturers, and the reaction of the cell to light of various wave lengths is such that exposure data for color photography is accurately indicated

Prices Reduced

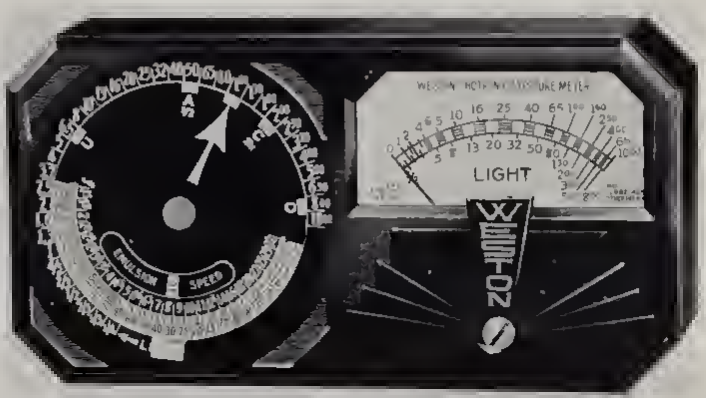
● It is announced by Victor Animatograph Corporation, that the following projector price reductions will become effective on August 1, 1935

Victor Model 10 Regular (500-watt), which previously listed at $149 50 with No 9 carrying case, will be reduced to $132 50 complete with No 8 Elite center-opening case

Victor Model 20 Super-HiPower (750-watt) which heretofore listed at $187 - 50 with No 8 case, will be reduced to $148 00 with No 8 case

These reductions have been attributed to a tremendous increase in demand which has made it possible to effect substantial reduction in production costs

Continued on Page 364



PEOPLE WANT TO SEE HIS FILMS

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"There is one fortunate circumstance, though, in the fact that most of our films are made in the Galapagos Islands. There, the wild life is not only extremely interesting to the biologists, but it hasn't been spoiled by too much contact with men. The animals (and birds, too) simply don't know what fear means; we can walk right among them, and make pictures to our heart's content. If we get too close, they simply move a foot or so to let us by! As a result, I make most close-ups of the seals, sea elephants, and so on, with a 15mm wide angle lens. Even for the most difficult shots, such as scenes of seals or sea elephants fighting in the water, I have never used a telephoto lens, I have a nice collection of them, but the longest I have ever had to use is a simple 2". I don't believe in tele-lenses for this work, anyhow, they make you use a tripod, sacrifice depth of focus, and restrict you in a dozen ways you can't put up with if you want the best pictures.

"As to film, we use regular reversal film and when we want prints, we have a duplicate negative made, and print from that. The latitude of reversal stock, combined with the marvellous control the better laboratories have in their processing, have proven invaluable to me, for many of my most important scenes have necessarily been made under the most unfavorable light conditions. Often I'll catch a shot I've been trying to get for three or four years—a shot that must be made in one special way, or else be worthless — under conditions where only the finest of film and the best of processing can turn the scale from failure to success.

"When it comes to editing the film, we have to be very careful—and merciless. Each of our pictures has a definite story to tell: the capture of a sea elephant, birds which cannot fly, snake-headed lizards, catching the huge 'sea devil,' or manta ray, the birth and education of a seal. Each must tell its whole story in one reel—400 feet. It must tell that story accurately, completely, and interestingly. There's always so much to tell that we can't waste even a foot of film for anything that isn't germane to the story. That means we must disregard all temptations to include this shot or that for mere prettiness, or because it may be of personal interest to us.

"There, I think, is one of the greatest faults of most travel and semi-educational films, whether professional or amateur. It's quite understandable, too. If you've photographed the picture, it's awfully tempting to include shots that are actually unimportant, simply because they are your pictorial pets, or because you remember how you sweat blood to get a difficult scene! It is really an advantage to have someone else edit your film. When it comes to editing our pictures, while I participate, Emory Johnson, who was one of the most skillful of silent-picture directors, is officially the Film Editor. He can keep his heart stony where I, who filmed the scenes, couldn't! After we feel the picture is completed, it must still pass inspection by a jury of the expedition's scientific experts.

"As a rule, our films are first shown with only well-made main titles, for they are shown with a lecture in which the speaker explains things as the film progresses. This not only gives us the assurance that the films will be properly presented, but also gives us a more intimate understanding of how audiences react, and what explanation they want.

"In building our programs, which are presented without charge, we try to make them both entertaining and instructive. Wherever possible, the Hancock Expedition films are presented with the Velero Ensemble, a musical organization composed of Captain G. Allan Hancock, as leader and cellist, John Garth, pianist and entomologist, Arthur Jensen violinist and collector, Sterling Smith, flutist and collector. They present forty-five minutes of classical and semi-classical music—ensembles, solos, duets and trios. After this comes forty-five minutes of pictures, three or four different subjects, usually arranged on a single 2,000-foot reel. In this way, we provide a really well-balanced programme that doesn't try to force information down the audience's throat.

"Completely titled prints of most of our films are also available to schools and educational institutions for the bare cost of printing. The only proviso attached to this by Captain Hancock is that such prints must not be exploited commercially."

When Swett showed me some of his films, I had no trouble at all in understanding why there are more requests for these films than can be complied with. Based on better than average technique, they are not mere sugar-coated "education", they are remarkable entertainment. One film, showing the birth and education of a seal, achieved what no other medium could, in presenting the birth of a seal in a wonderful, yet altogether natural way which robbed that delicate subject of all its unapproachable phases. There was, incidentally, not a single human shown in the entire reel—yet one was never for a moment conscious of their absence, or bored by being "taught something about seals." Another reel, showing the capture of a two-ton sea elephant, contained some of

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Surely, here is a camera coupling a wide range of studio effects with 16 mm. economy. Yet, so many and varied are the fields which have enlisted the aid of the "Special," that the instrument shop in which it is fabricated has introduced several new accessories to even further widen its usefulness.

Some of these are shown and described below. Others, highly specialized, do not warrant adoption as standard accessories. Rest assured, however, that either the basic model or an adaptation will perform any task of picture making within the scope of 16 mm. cinematography. You are invited to submit specifications.

Free—AN INTERESTING BOOKLET

Generous in size, copiously illustrated, a copy of "Presenting Ciné-Kodak Special" is yours upon request. Write to Eastman Kodak Company, Rochester, N. Y.

THE OPTICAL FINDER The Optical Finder corrects parallax, can be calibrated for all focal length lenses from 15 mm. wide angle to 6-inch telephoto, shows the correct field from infinity down to two feet. Price on request

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ACCESSORY LENSES Besides the standard *f* 1.9 lens for the "Special," there are available a 20 mm *f* 3.5 lens, 15 mm. *f* 2.7 wide angle lens, and a new series of four telephoto lenses Due to the introduction of an adapter, made in three types—for the "Special," Ciné-Kodak K, and for 16 mm. cameras using the standard thread—these telephoto lenses are interchangeable on most 16 mm. movie cameras. The minimum focusing distances embossed upon them can be about halved by an exclusive and most important feature available to "Special" users. By removing a red stop screw the lenses can be screwed out so that larger images may be obtained at closer working distances—and when this is done only visual focusing with the "Special's" reflex finder should be employed. Here are the reduced distances and widths of field obtained.

Lens	Minimum Focusing Distances	Width of Field
2-inch *f* 3.5	13 Inches	17⅓ inches
3-inch *f* 4.5	24½ inches	24¼ inches
4½-inch *f* 4.5	39½ Inches.	33⅜ Inches
6-inch *f* 4.5	57 inches	23¾ inches

The prices of these new design telephoto lenses, exclusive of adapters (which are priced at $6.50), are $32.50 for the 2-inch *f* 3.5 and the 3-inch *f* 4.5 lenses; $53.50 for the 4½-inch *f* 4.5 lens; and $78.50 for the 6-inch telephoto lens—showing the substantial saving effected by the introduction of this independent adapter lens system.

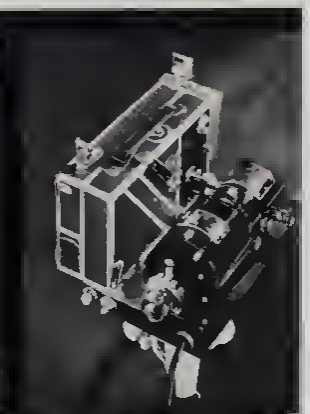
LENS EXTENSION TUBE OUTFIT Specialists in certain fields will desire to work at still closer ranges without enlisting the aid of microscopes. To fill this need the Lens Extension Tube Outfit has been introduced. Here are the minimum fields which can be covered by using these tubes:

Lens	Minimum Width of Field
1-inch *f*.1.9	.047 inches
2-inch *f* 3.5	108 inches
3-inch *f* 4.5	162 inches
4½-inch *f* 4.5	243 inches
6-inch *f*.4.5	324 inches

The Extension Tube Outfit is sold as a complete unit—flange, and four tubes of varying lengths. Price on request.

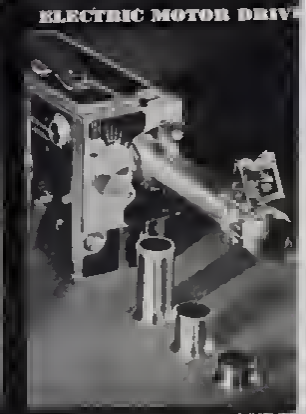
Eastman Kodak Company, Rochester, N. Y.

THE OPTICAL FINDER



ELECTRIC MOTOR DRIVE

ACCESSORY LENSES



LENS EXTENSION TUBE

the most thrilling shots imaginable — magnificent close shots of a battle-royal between two of the beasts In this film, of course, the human element was evident but although the human cast included scientists of world-wide renown, not a single scene called attention to them as personalities Animate instruments in the capture of the sea-giant, yes, but as conscious actors, never There was not one close-up!

"Don't you ever make intimate shots of the members of the party at play?" I asked

"Of course," was the reply. "But we cut them out and make a separate reel for our personal pleasure We may matter to ourselves, but audiences at large —what do they care about who we are, or what we look like? All that matters is what we do!"

Traveling Matte Tricks with 16mm Negative

Continued from Page 353

If your camera is equipped with a single-frame stop-motion movement, you can make a number of other interesting mattes by animation Ordinary 16mm cameras can often be persuaded to expose only one or two frames at a time, so if you have a very light touch on the trigger, you may find it possible to make some of these mattes even without a regular single-picture movement

First of all is the disc effect This is most easily done if the title-board can be stood on end, so that the card is level Take a number of black cardboard discs, and, when you have made the required footage of the white card, stop the camera and drop one of the discs in Take a few more frames, stop again, and drop another disc in—and so on until the entire field is blanked out by the overlapping discs Don't bother to cut the discs in regular order half the charm of this effect is through the irregular appearance of the discs, scattered all over the field You can do the same thing with cut-out musical notes, or any sort of cut-out shape that fits the picture

Another stop-motion matte is the venetian-blind effect This is made by beginning with half-a-dozen or more black lines across the white frame After two or three frames, the camera is stopped, and the lines widened a bit As the lines grow wider and wider scene 2 will spread itself into the picture exactly as though you were looking through a shutter that was being opened

You can also divide the frame into quarters, and animate alternate squares in, checkerboard-fashion For instance say you animate in the upper left and lower right quarters the left one would animate up from the center, while the right one animated down When they reached the edge of the frame, the animation could continue horizontally—to the right above, and left, below, until the whole field was covered

A spiral wipe can easily be made this way, too Start with a single line running from the top of the frame straight down to the center Then widen this, spreading radially from the center, until you have carried the matte completely around, blacking out the whole field

Fan wipes, incidentally, can be made by animation in this way, too

In a recent production for which I made wipes, I had this problem In scene 1, the movement of the people was from left to right, in scene 2, the movement was from right to left If I made a straight wipe, these movements would conflict How was the transition to be made pleasing? I did it by animating a straight push-off wipe from left to right—but only up to the middle of the frame Then I revolved the matte front (by animation) around the center of the frame—and finished the wipe from right to left

In Mae West's "Belle of the 90's," I used a rotary wipe to go from a close-shot of a riverboat's paddle-wheel to the next sequence Again, the matte was made by animation Four dark bars animated in, radiating from the center of the frame These were progressively animated larger and larger, until the scene was wiped off At the same time, the bars revolved clockwise around the center of the frame This was done by revolving the entire card around as the bars animated To simplify the job, you could mark calibrations for the animation of the bars, just outside of the camera-field, and—with the whole layout done on a large disc, you could mark calibrations for revolving the whole The two sets of calibrations need not be the same, so that the two movements—the turning of the wipe, and the growth of the dark bars—could be made at two different speeds Simply enlarge the bars one calibration each frame, and at the same time, revolve the whole card one degree In one of our recent films we used this type of wipe as a transition between a shot of a girl making a phone call and the party at the other end of the wire making the wipe from a close-up of the girl's finger dialing the number, as the dial spun, the wipe started and revolved with it

Especially with these more complicated wipes, it is a very good idea to keep your original two mattes as "master negatives," and to do your printing from dupes of them In that way, you can cut your mattes to length, secure in the knowledge that if you make a

mistake, you won't have to do all the work over again—and you'll always have the master negatives for further wipes later.

In making these mattes, it helps, too, if you remember that normally the black cards represent scene 2, and the movement of the cards (or black animations) shows which way scene 2 is going to appear in your completed transition.

WHEELS OF INDUSTRY

Continued from Page 359

New Titles

● It is announced by Bell & Howell Company that a new line of Title-Craft titles is available for movie makers.

These new titles are called "Title-Craft Junior" and are particularly attractive and legible.

They have the following distinct advantages: a choice of many beautiful and appropriate all-over backgrounds at the same price as for block backgrounds, careful arrangement of type matter for artistic appearance and legibility, many pictorial backgrounds available at only ten cents more than the minimum price, fine technical quality in filming.

Specimen "Junior" titles or a complete set of the many available backgrounds may be seen at most photographic dealers', also a demonstration film composed of eight or ten titles.

The hand-set Title-Craft titles have been extremely popular, and this new series will undoubtedly meet with equal favor in the lower price field.

Victor Cabinet Projector

● Victor Animatograph Corporation has just introduced a new, enclosed, cabinet-type of silent 750-watt projector. It is believed that the greater eye-appeal and unusual convenience of this unique new projector will win popularity. It is to be known as Victor Model 21 and will probably list at $185.

Although the projector is extremely compact, measuring only 8½"x13¼"-x16¼", it is equipped with 1600-ft. reel arms. When the full film capacity is utilized, a one-hour presentation may be made without stopping to change film. Smaller reels may be used if desired.

Among the Model 21's standard equipment items are Pilot Light, Rapid Power Rewind, quick, positive Tilting Device and a new "Swing-out" type of Lens Mount with side frame, which greatly facilitates threading, framing, and cleaning of the film channel and aperture plate.

The cabinet is finished in natural walnut and appointments are in Antique Silver. Projector is entirely enclosed by the case during operation.

First deliveries will be made around August first.

Common-Sense Filtering

Continued from Page 351

black if the filter is dense enough—so the clouds will fairly leap out. The yellow is lightened rather more—even excessively. And, on the other hand, the flesh tints of the girl's face, if we use a heavy filter, will become unnaturally white.

Now let's try a green filter: the yellow will still be rather light, the face-tones will be little changed, except for perhaps a slight darkening, the blue will be virtually unaffected—so we will lose the clouds, but the green foliage will be decidedly lighter.

Briefly, to lighten yellow, and darken blue, we use the yellow filter.

To lighten red and make blue very much darker, we use a red filter.

To lighten green and darken red, we use a green filter.

In other words, the filter lightens its own color, and darkens its complementary colors, and the degree of effect is in ratio to the darker or lighter tint of the filter-color.

The majority of filters sold for amateur use are yellow ones. Too many of them are designated simply by the multiplying factor used to determine the added exposure necessary: that is, 2x, 4x, and so on, which really means 2 times, 4 times, etc. The Wratten yellow filters include the K1, K2, and K3, with also the "Aero 1" and Aero 2, which are slightly tinged with greenish-yellow, designed especially for penetrating the light haze that is always visible from the air.

The principal red filters are the Wratten 23A, A No. 25, and F No. 29. Several of the leading makers of amateur

cinemachinery, including Bell & Howell and Victor, have red filters which they designate simply by the multiplying-factor, as, for example, "4x Red."

The outstanding green filters are the Wratten "B" filters (especially No 56B) and the new "X" filters. The latter were lately devised for special work in professional still photography, but have become rather popular for amateur photography and cinematography. They must not be confused with the ordinary yellow filters designated by a number followed by the letter x. Strangely enough, the X1, if designated by its multiplying factor, would be called a 5x green!

From all of the above, you can see that for most general use (assuming, of course, Panchromatic film) a yellow filter is indicated except at such times as the specialized effects of a red or green one may be demanded. Therefore, it is good policy to put such a filter—say a Wratten K2, or any good 2x or 3x yellow filter—on your lens and leave it as standard equipment. When you want particularly striking cloud-effects, with the white clouds standing strongly against a dark sky, use either a heavier yellow filter, an orange filter (such as the Wratten "G," which is intermediate between the yellows and reds), or a red filter. As for the green filters, they are best used only when you have a good deal of green in the picture—grass, foliage, etc.—and you want to lighten it.

And—as one last hint—don't expect a filter to do the impossible! Your photography must be good in itself, or no filter in the world can improve it. Moreover, especially when you are shooting clouds, the atmospheric conditions must be right. We normally think of the sky as being blue—but often, especially in dry, dusty weather, the sky near the horizon is really a sickly greenish blue, which no filter will darken satisfactorily. Be sure that your sky is a good, clean, strong blue if you want the best filter-effects on cloud scenes!

Cine Story-Telling Pays

Continued from Page 358

about this trip, you would want to know, "How many fish did he catch? What kind? Were they good sport? How did he catch them? How did he live—in a hotel, a cabin, or did he camp under canvas, far from civilization? How did he get there—by boat, by car, or by pack-mule? Who went with him? Did he know where to go, or did a guide go with him?

You can answer every one of those questions in film. Done properly, the answer will not only be interesting to your friends and to fishermen in general, but to the same audiences who snoozed through your last vacation epic.

People who act as though they knew they were being photographed are fatal to any film. They break the continuity of thought you've developed in your audience. Instead of being interested in the picture, the beholder turns his attention to the triple-distilled idiot in front of the lens. Therefore, if you can't be sure that the people around your lens are going to act reasonably natural in the scene, by all means don't waste film on them.

But in the films where people are really necessary—give them something to do! Nine times out of ten, the reason folks are foolish in front of a movie-camera is because they don't know what to do with themselves given something to do—if it is merely walking across the scene—they lose most of their camera-fright, and become more or less human once more.

When people figure in a film-story, closeups are vitally necessary. In the Hawaiian film, for instance, the only way you can tell the story of the pond raw-fish eating episodes is in close-ups. But untrained actors almost always grow nervous when a camera is brought sufficiently close for a revealing close-up. This is a problem for the telephoto lens. Snap a 2" —or even a 3"—into place, and you can make your close-ups from an un-terrifying distance. Try it.

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Amateur Movie Contest

The annual American Cinematographer Amateur Movie Contest will close this year on November 30. That is, all entries must be in our office on that date.

As usual the members of the American Society of Cinematographers will act as judges.

There will be four outstanding prizes. None worth less than $150.00.

THE GRAND PRIZE will be	$250 cash
EASTMAN KODAK CO. offers	$150 in Equipment
BELL & HOWELL offers	$150 in Equipment
VICTOR ANIMATOGRAPH offers a Model 4 Camera complete with f 2.9 Focusing Mount, 1" Lens and a No. 1 Carrying Case, value	$147

It isn't too late to start your picture now if you haven't already done so. It can be in as many reels as you wish, it can be either 16mm or 8mm. Write for more information and Entry Blank.

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